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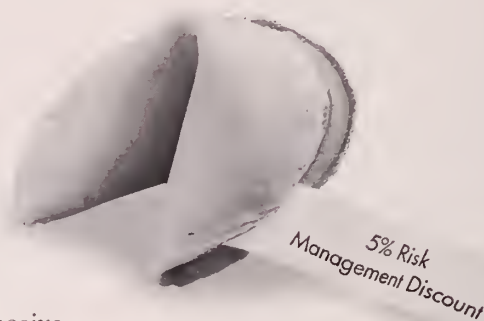
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About the cover: Ice climber begins a 200 ft ascent along Turnagain Arm, Alaska. Photo courtesy of Charles Allyson

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Measurement of antimicrobial susceptibility among invasive isolates of *Streptococcus pneumoniae*: Comparison of the Etest with the standard agar dilution method.

Mary Anne Fitzgerald, BS, MPH⁽¹⁾

Alan J. Parkinson, PhD⁽¹⁾

ABSTRACT

High rates of invasive disease caused by *Streptococcus pneumoniae* occur in the Alaska Native population. Because of the wide use of empiric antibiotics to treat infection in rural regions of Alaska and concern over the emergence of pneumococcal strains now resistant to an increasing number of antibiotics we compared a simple strip system (Etest) for the measurement of antibiotic susceptibilities to the standard agar dilution method. Eighty-two pneumococcal isolates were tested by both methods. Overall, the Etest MICs of 91 % of the isolates agreed within one log₂ of the agar dilution, and 99.3 % agreed within 2 log₂ dilutions. There were no very major or major interpretative category discrepancies with the Etest for any antibiotic tested. There were 4.1 % minor interpretative errors with the Etest, which generally occurred at the breakpoint between susceptible and intermediate resistance. The results indicated that the Etest was comparable to the agar dilution method for the measurement of antibiotic MICs for *Streptococcus pneumoniae*.

INTRODUCTION

The past several years has seen a rise in the resistance of *Streptococcus pneumoniae* to an increasing number of antibiotics. Since the advent of the antibiotic era in the 1940s, the consensus has been that *S. pneumoniae*, like *S. pyogenes*, would continue to be susceptible to penicillin. However, with increasing use of antibiotics, strains of *S. pneumoniae* have acquired individual resistance not only to penicillin

and other primary drugs, as well as multiple resistance, i.e., resistance to three or more classes of antibiotics.

Despite global reports of increasing resistance of pneumococci to antibiotics (1), a 1979-1987 report of antimicrobial resistance of *S. pneumoniae* in the United States (2), showed relatively low levels of resistance among pneumococcal isolates during that time period. In Alaska between 1980 and 1984, 27% of invasive *S. pneumoniae* isolates received at the Center for Disease Control and Prevention's (CDC) Arctic Investigations Program (AIP) showed only moderate resistance to penicillin (MIC 0.1- μ g/ml); all isolates were sensitive to erythromycin (MIC \leq 0.5 μ g/ml) and trimethoprim sulfamethoxazole (MIC \leq 0.5/9.5 μ g/ml) (3). These were serotype 19A strains, most being from the Yukon Kuskokwim Delta in southwest Alaska. Between 1986 and 1990, however, 17% of the invasive *S. pneumoniae* isolates showed intermediate resistance to penicillin; of these, 80% were serotype 6B, resistant to both erythromycin and trimethoprim sulfamethoxazole (4). Of even greater concern, however was the confirmation of pneumococcal strains in Alaska that were both fully resistant to penicillin and resistant to other commonly used antibiotics (5).

In 1993, multi-drug resistant pneumococcal disease was targeted by the CDC as one of the emerging infectious disease threats within the United States (6). Since Alaska Native children < 2 years old living in southwestern Alaska have an annual incidence of pneumococcal disease of 1195/100,000 (7), it is critical that resistant strains of pneumococci are identified quickly by each clinical laboratory so that appropriate antibiotic therapy can be prescribed.

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Antibiotic susceptibility results must be obtained easily, economically, and reliably. For small remotely located laboratories, the Etest (PDM Epsilon AB Biodisk, Solna, Sweden) may be the answer. Since its introduction in 1987, the Etest (8) has been rapidly gaining acceptance as an alternative to disk-diffusion and dilution tests (9-13). The Etest strip provides a predefined gradient of 15 two-fold dilutions of an antimicrobial on a thin, flexible strip, combining the ease of disk diffusion testing with the added advantage of obtaining a discrete MIC value. Once the Etest strip is transferred to an agar plate, a continuous gradient of the antibiotic is established and an elliptical zone of inhibition is formed after 20-24 hour's growth. The MIC is read at the intersection of the growth ellipse margin.

Because of the increasing concern over the emergence of pneumococcal resistance in regions of Alaska where empiric treatment of bacterial infections are common, we directly compared the Etest with the standard agar dilution test for *S. pneumoniae* to confirm the ease of use and reliability of this test for measuring antibiotic MICs.

MATERIALS METHODS

Since 1980, CDC's AIP, has been monitoring antimicrobial resistance trends of *S. pneumoniae* as part of statewide surveillance. Twenty-six hospital laboratories and one outpatient microbiology laboratory were requested to send any pneumococcal isolates recovered from a normally sterile site.

Upon receipt, *S. pneumoniae* isolates were confirmed by alpha hemolysis, colonial morphology, susceptibility to ethylhydroxycupreine hydrochloride (Optochin: Difco Laboratories, Detroit, MI) and bile solubility. The cultures were screened for penicillin susceptibility by disk diffusion, using a 1- μ g oxacillin disk. All cultures are sent to the Division of Bacterial and Mycotic Diseases, National Center for Infectious Disease, CDC, Atlanta, for serotyping.

The cultures were then frozen at -80°C in defibrinated sheep blood. Susceptibility testing was performed at AIP by using the agar dilution method as described by the National Committee for Clinical Laboratory Standards (NCCLS) (4). The following antibiotics were tested: penicillin, erythromycin, trimethoprim sulfamethoxazole, tetracycline, chloramphenicol, ceftriaxone, cefotaxime, cephalothin, cefaclor, vancomycin, and rifampin. The MIC was determined to be the lowest concentration of antibiotic that inhibited growth. The NCCLS interpretive standards used in this study are shown in Table 1.

Eighty-two isolates of *S. pneumoniae*, serotyped as 6B, were used for this comparison because of the appearance of multiple drug resistance in this serotype strain. Seventy-seven of the cultures were blood isolates, four were from cerebral spinal fluid, and one was an autopsy culture of the meninges.

Cultures were retrieved from the frozen state and plated to sheep blood agar plates. Three subsequent subcultures were done to ensure optimal characteristics before the Etest was performed. Preliminary testing examined the readability of Etest end-points obtained on media from three different suppliers (Remel, Lenexa KS; BBL, Microbiology Systems, Cockeysville, MD; PML Prepared Media Laboratories, Tualatin, OR) as well as the reproducibility of end-point determination by two readers. Although the numbers were small, there were no statistical differences between results read by different laboratory technicians, nor those obtained with the different media. PML Mueller-Hinton agar was a subjective choice.

The Etest strips and ranges selected were penicillin (.002 - 32 μ g/ml), erythromycin (.016 - 256 μ g/ml), chloramphenicol (.016 - 256 μ g/ml), cefotaxime (.002 - 32 μ g/ml), and trimethoprim/sulfamethoxazole (.002 - 32 μ g/ml). Control cultures for the Etest were:

Table 1.

The NCCLS interpretive standards for *Streptococcus pneumoniae* used in this study.

ANTIBIOTIC	SUSCEPTIBLE	INTERMEDIATE	RESISTANT
Chloramphenicol	≤ 4	8	≤ 16
Cefotaxime	≤ 0.25	0.5- 1	≤ 2
Erythromycin	≤ 0.5	1 - 2	≤ 4
Penicillin	≤ 0.06	0.1 - 1	≤ 2
Trimethoprim/sulfmethoxazole	$\leq 0.5/9.5$	1/19 - 2/38	$\leq 4/76$

S. pneumoniae ATCC 49619, *S. pneumoniae* 77-110901, and *S. pneumoniae* CDC 8104.

Culture suspensions for the Etest were prepared in cation-supplemented-Mueller Hinton Broth equivalent to a 0.5 McFarland standard using the Abbott Ajust (Abbott Laboratories, Abbott Park, North Chicago, IL) and then tripled streaked. The plate was rotated after each streak to ensure an even lawn. The Etest strips were applied to the plates after 10 minutes (to allow the plates to dry), and then incubated at 35°C in CO₂ for 20 hours. The MIC was read at the intersection of the inhibition eclipse. A small magnification lens was used to read the MIC. Reading or interpretation of different or unusual growth patterns was according to recommendations by the manufacturer. Because the Etest strip is marked in one-half log₂ concentrations it is possible to record MICs in increments smaller than the usual two-fold increments used for standard agar dilutions. Consequently, Etest MICs in this study were rounded up to the next higher log₂ MIC for comparison with agar dilution.

RESULTS

When MIC concentrations between the Etest and agar dilution were compared for the 82 isolates tested by both the Etest and agar dilution, the chloramphenicol MICs agreed within one log₂ dilution in 98.8% (81/82) of the isolates, and within 2 log₂ dilutions for all isolates tested (Table 2). Cefotaxime and penicil-

lin agreed within one log₂ dilution for 96.3% (79/82) of the isolates tested, and within 2 log₂ dilutions for 100% (82/82). Trimethoprim/sulfamethoxazole agreed within one log₂ dilution for 76.8% (63/82), and within 2 log₂ dilutions for 97.6% (80/82) of isolates tested. Overall, the Etest MICs of 91% (373/410) of the isolates tested agreed within one log₂ dilution of the agar dilution and 99.3% (407/410) agreed within 2 log₂ dilutions.

When interpretive categories were compared, there were no very major or major interpretative category discrepancies with the Etest for any of the antibiotics tested, using the approved NCCLS interpretative categories specific for pneumococcal testings (14). The interpretive error categories used were very major error (false susceptibility, i.e., those susceptible by the Etest and resistant by agar dilution); major error (false resistance, i.e., those resistant by the Etest and susceptible by agar dilution); and minor error (susceptible or resistant by one method and intermediately resistant by the other method).

Overall, there were 4.1% minor interpretative errors with Etest results. These generally occurred at the breakpoint between susceptible and intermediate resistance. Both chloramphenicol and erythromycin showed 100% (82/82) agreement between categories of susceptibility. For cefotaxime there was 98.8% (81/82) agreement. There was one minor error, where the agar dilution was 0.12 (susceptible) and the Etest

Table 2.

Comparison of *Streptococcus pneumoniae* Etest MICs with Agar Dilution MICs

ANTIBIOTIC	No. STRAINS	NUMBER OF ETEST MICS WITHIN CONCENTRATION OF AGAR DILUTION MICS							% AGREEMENT WITHIN ±1 LOG ₂
		+3	+2	+1	0	-1	-2	-3	
Cefotaxime	82	0	2	15	43	21	1	0	96.3
Chloramphenicol	82	0	1	18	50	13	0	0	98.8
Erythromycin	82	0	11	35	28	8	0	0	86.6
Penicillin	82	1	1	21	39	19	1	0	96.3
Trimethoprim/sulfamethoxazole	82	1*	0	1	29	33	17	1*	76.8
Total		2	15	90	189	94	19	1	

* Variations occurred within the susceptible category

was 0.5 (intermediate). Penicillin showed 96.3% (79/82) agreement. Three minor errors occurred: agar dilution = 0.06 (susceptible) and the E test = 0.12 (intermediate) for one culture and the agar dilution = 0.12 (intermediate) and the E test = 0.06 (susceptible) for two cultures. For trimethoprim/sulfamethoxazole, there was 85.4% (70/82) agreement in susceptibility categories. Twelve minor errors occurred — eight in which the agar dilution was resistant and the Etest intermediate; two in which the agar dilution was intermediate and the Etest susceptible, one in which the agar dilution was intermediate and the Etest resistant; and one in which the agar dilution was susceptible and the Etest intermediate.

DISCUSSION

Over the years, standardized methods have been developed to detect antibiotic resistance. The disk-diffusion method (originally the “Kirby-Bauer”) has several advantages: several drugs can be tested on one Mueller-Hinton agar plate, it is relatively quick and easy to perform, and it is inexpensive (15). However, disk-diffusion tests can only be performed reliably on “drug-bug” combinations for which NCCLS interpretive standards have been established. The oxacillin disk-diffusion test is recommended to screen pneumococcal isolates for penicillin susceptibility. While a zone of > 20 mm indicates susceptibility to penicillin, a zone of < 19 mm does not differentiate between full resistance (MIC > 1.0 µg/ml) and intermediate resistance (MIC > 0.12 to 1.0 µg/ml). A reference confirmatory test, such as broth microdilution or agar dilution, must then be performed to determine the penicillin MIC. These tests, however, are not always practical or economical, especially in many smaller clinical laboratories.

The Etest has now become widely used as a simple method for measuring the MIC of a variety of antimicrobial agents for both fastidious aerobic and anaerobic organisms (16-19). The results of this study indicate that the Etest is comparable to the agar dilution method for the measurement of antibiotic MIC. However, care should be taken, when determining the MIC of *S. pneumoniae*, that the actual margin of growth is read and not the zone of hemolysis. Studies have found that incubation in CO₂ improves the agreement between the Etest and agar dilution (11). Current recommendations are for incubation in CO₂.

Since the Etest technique is similar to that of the basic disk diffusion it can be easily introduced into the laboratory work flow. A penicillin Etest strip can

be combined with several antibiotic disks on a 150-mm plate to determine several susceptibilities, allowing laboratories to design their own test panels.

Our experience with the Etest has confirmed its ease, convenience, and reliability for testing pneumococcal isolates. Clinical laboratories can immediately screen isolates from patients with meningitis for susceptibility to penicillin and an extended spectrum cephalosporin as soon as colonies are identified. Screening isolates from patients without meningitis with an oxacillin disk followed by the Etest of isolates with zone diameters of < 19mm may be more cost-effective.

ACKNOWLEDGMENTS

We wish to thank the 23 hospital laboratories in the State of Alaska who provided pneumococcal isolates for this study and for the statewide surveillance of invasive bacterial disease. This activity allows the monitoring of trends in invasive disease rates and antimicrobial resistance emergence in Alaska and provides a platform for the development and evaluation of preventive strategies.

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Carbon Monoxide Hazards in Rural Alaskan Homes

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ABSTRACT

Alaska has the highest age-adjusted death rate from unintentional carbon monoxide poisoning in the nation. We conducted a study in five villages to determine carbon monoxide levels and sources. Nearly 10% (10/105) of the homes had elevated levels. Improperly vented propane Paloma water heaters were most commonly responsible and produced the highest levels of carbon monoxide. Other sources were leaking pipes from wood stoves and stoves that had been left on for several hours. We recommend that Paloma water heaters not be used where freezing temperatures create a risk for carbon monoxide poisoning, fires, and explosion. Safety education campaigns should note the risks of Paloma water heaters and defective stove pipes, and the need for increased kitchen ventilation during prolonged cooking. Medical workers need to be informed of the prevalence of carbon monoxide exposures. Homeowners can install carbon monoxide detectors, although expense and false alarms remain barriers to their use.

INTRODUCTION

Carbon monoxide (CO) is the leading cause of death from unintentional poisoning in the United States (1). Motor vehicle exhaust, home furnaces, stoves, and fireplaces are the most commonly-cited sources of exposure (1-3). Alaska is the state with the highest age-adjusted death rate from unintentional carbon monoxide poisoning. Its rate of 2.72 per 100,000 persons is more than five times the national average of 0.51 per 100,000 (1).

We became concerned about CO hazards in rural Alaska in 1994. That year, eight residents from three different homes were treated for suspected carbon monoxide poisoning by the physician assistant stationed at a village health clinic. The victims ranged in age from 6 to 51 years. Symptoms included dizziness, vomiting, headache, and tachycardia. Two patients became unconscious. A carboxyhemoglobin (CO-Hb) level obtained from one patient was 35% (a non-smoker's CO-Hb level is usually less than 2%) (4).

To determine the prevalence of elevated CO levels in village homes, and identify the likely sources, we conducted a field study using a portable CO analyzer. As a result of our investigation, we provide specific recommendations to reduce the likelihood of CO poisoning in rural Alaskan homes.

METHODS

Between November 1995 and March 1996, we tested CO levels in private homes in five Alaska villages. The CO testing was voluntary. Homeowners were informed about the availability of CO testing through public service announcements, flyers, and door-to-door visits. Two of the villages are connected to the road system. The other three villages are accessible only by plane or boat. Most homes are log homes with two bedrooms, a kitchen, living room, and bathroom. They usually have indoor plumbing with a water heater, a propane gas kitchen range, and a wood stove. Many also have propane gas heaters to provide additional heat during the winter.

The CO levels were measured with a Bacharach Monoxor Carbon Monoxide Analyzer. This analyzer is a hand-held, battery-operated instrument which continuously measures and digitally displays readings from 0-2000 parts per million (ppm) with an accuracy of $\pm 5\%$ (as per the manufacturer's insert). After a three-minute warm-up period, samples were taken in each room containing a potential CO source such as a stove or water heater. One appliance, the Paloma water heater (PWH), is an "on-demand"

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device; that is, it heats water only when a hot water faucet is turned on in the home. For the PWH, therefore, CO measurements were made after running the hot water for two-minutes.

CO levels were considered elevated if they were above 9 ppm. This criterion is based on exposure recommendations of the U.S. Environmental Protection Agency (EPA). The EPA states that a person should not breathe CO concentrations of 9 ppm or higher for any eight-hour period, 35 ppm or higher for any one-hour period, or 200 ppm higher at any time (5).

RESULTS

Table 1 shows, for each village, the total number of households, the number and percentage of households tested for CO, and the number of homes with elevated CO levels (greater than 9 ppm). Nearly 10% (10/105) of the tested homes had high levels of CO.

Table 1. Results of CO Testing in 5 Villages			
Village	# of Homes	# of homes tested for CO N (%)	# with high CO levels
"A"	231	30 (13)	4
"B"	91	27 (30)	1
"C"	64	18 (28)	2
"D"	77	15 (19)	3
"E"	50	15 (30)	0
TOTAL	513	105 (20)	10 (9.5%)

Table 2, the highest level of CO was associated with a non-vented PWH. Even baseline levels of CO in rooms containing a non-vented PWH were often above 9 ppm. For example, one home had CO levels of 13 ppm in both the kitchen and the adjoining bathroom where the PWH was located. After letting the hot water run for two minutes, the level of CO in the bathroom increased to 55 ppm and 21 ppm in the kitchen. Of the seven homes that had a PWH with ventilation, the mean baseline CO level was 6 ppm; after two minutes of running hot water, the average CO level remained 6 ppm. Among the six homes with a non-vented PWH, the average CO level at baseline was 7 ppm but increased to 20 ppm after two minutes of heating water.

DISCUSSION

Paloma water heaters are the most obvious risk factor for potentially harmful levels of CO in the homes we surveyed. In fact, all eight index cases of CO poisoning were associated with the patient or someone in the household having taken a hot bath. Symptoms usually appeared soon after the bathtub was filled with hot water. All three homes had a PWH. While the highest CO level we recorded was 55 ppm, the level would undoubtedly have been higher had we run the hot

Sources for the elevated levels of CO are shown in Table 2. In six of the ten homes, Paloma water heaters were responsible for the increased levels of CO. Most (5/6) of these heaters were not properly vented, although one water heater did have a ventilation outlet. Elevated levels of CO were associated with leaking pipes from wood stoves in two homes. In both these instances, the homeowners had wrapped aluminum foil around the defective pipes as a makeshift repair. Two other homes had elevated CO levels from propane gas stoves that had been left on for several hours while cooking.

Among the 105 homes in this field survey, 13 had a functioning Paloma water heater (PWH). Forty-six percent (6/13) of these homes had elevated CO levels compared to four percent (4/92) of homes without a PWH ($p < 0.001$, Fishers Exact test). As noted in

Table 2. Homes with Elevated CO Levels (N=10)		
CO Source	# of homes	Highest level of CO measured (ppm)
Paloma hot water heater, non vented	5	55
Paloma hot water heater, vented	1	10
Leaking pipes from wood stove	2	17
Propane gas stove	2	14

water for more than two minutes (it takes about 10 minutes to fill the average bathtub). The shorter time was chosen at the request of homeowners concerned about their fuel costs. In one home where we allowed the water from a PWH to run for 10 minutes before testing, the CO level was over 150 ppm.

The Paloma heaters are popular because they are less expensive to purchase than tank-type water heaters, and cost less to run because they heat water "on demand" rather than continuously. Although the instruction manual clearly states that installation should be done only by a "certified and/or licensed plumber," almost all the heaters were installed by inexperienced homeowners. The PWH instruction manual also states that the heater should not be exposed "to freezing temperature in the venting system or surrounding room." Consequences of freezing include "possible explosion of the unit, and attendant injury to person." (6) The risk of CO poisoning is nowhere mentioned in the manual. In fact, the manual states that "if the water heater is installed in an unconfined space within a building, . . . infiltration air is normally adequate for proper combustion and ventilation." Homeowners could decide that a bathroom or kitchen was an "unconfined space" making external venting unnecessary. The highest CO levels came from heaters not vented to the outside. Despite a warning in the manual to not install the heater "in bathrooms, bedrooms, or any occupied rooms normally kept closed," the majority of the Paloma water heaters were installed in bathrooms.

Other CO hazards we identified are the improper repair of defective wood stove pipes and prolonged use of propane stoves for cooking. Although the peak CO levels (17 and 14 ppm, respectively) from these causes are not as great as those from nonvented PWHs, chronic exposures represent a serious hazard (1,4,7-9). Cigarette smokers are especially at-risk, because their baseline CO-Hb levels are often already elevated at 5-9% (4). Among Native populations in Alaska, 50-60 percent of adults smoke cigarettes. (10) Also, rural Alaskan homes are often small (less than 1,000 square feet) and tightly-sealed to conserve heat. Both of these factors increase the risk of indoor CO exposure.

RECOMMENDATIONS

We recommend that Paloma water heaters not be used in rural Alaska, where winter temperatures can fall to -40 to -60 degrees Fahrenheit for weeks at a time. The risks of CO poisoning, fires, and explosion of Paloma water heaters make these units totally inappropriate for use in village homes. Many

homeowners we interviewed had to replace their Paloma heaters due to frozen pipes. In fact, at the time of our field survey, two homes had Paloma water heaters that were vented but could not be tested due to frozen pipes.

Because elevated CO levels were detected in nearly 10 percent of the homes we surveyed, safety education campaigns in Alaskan villages should include information about the risks of Paloma water heaters, defective stove pipes, and the need for increased kitchen ventilation during prolonged cooking with propane stoves. A community-based CO prevention program in Pennsylvania dramatically reduced CO-related fatalities (9). Medical workers also need to be informed of the prevalence of CO exposures and the value of obtaining CO-Hb levels in patients with possible CO poisoning. The test results may not alter acute management because they may not be available for several days, having to be sent to referral laboratories in larger cities. However, the results can be invaluable for surveillance and prevention of CO-related morbidity and mortality by identifying the magnitude and prevalence of CO exposures.

Homeowners concerned about CO exposures can install carbon monoxide detectors. Home detectors cost between \$30 and \$100. There are both plug-in and battery-powered models. The latter do not require an electrical outlet and will work in the event of a power failure. False alarms and expense remain as barriers to the widespread use of home detectors. The false alarm problem can be reduced by installing detectors with digital readouts and by each village having a portable CO analyzer to more accurately establish CO levels. Price and performance characteristics of currently-available CO detectors have been recently reviewed in a popular consumer publication (11).

ACKNOWLEDGMENTS

The authors are grateful to Ron Perkins, Alaska Area Injury Prevention Specialist; Peter Wallis, TCC Office of Environmental Health; Leon Robertson, Nanlee Research; and Sara Berger, The Lovelace Institutes, for their assistance in the design of the study and preparation of the manuscript. This research was performed while James Howell was in the 1996 Indian Health Service Injury Prevention Fellowship Program. The opinions expressed in this paper are those of the authors and do not necessarily represent those of the Tanana Chiefs Conference, Indian Health Service, or The Lovelace Institutes.

(continued)

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(continued from page 14)

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MIEC Premium Credits Average 55% in 1997; Rates Decrease 5%

On February 1, MIEC began distributing \$2.3 million in premium credits to its renewing Alaska policyholders, reducing their net out-of-pocket costs by an average of 55%. Credit amounts vary with the length of time a policyholder has been insured by MIEC and with amounts of premiums paid. Of the 254 Alaska policyholder who will participate in these credits, 59.8% will receive credits of at least 50% of their 1997 premiums. This is MIEC's eighth consecutive year of premium credits for Alaska policyholders. Since 1980, MIEC's all-physician Board of Governors has authorized a total of \$152 million in premium credits.

This is MIEC's sixth rate reduction for Alaska policyholders in the past seven years. In 1997, MIEC's Alaska policyholders will pay 43% less than they did in 1990.

MIEC is Alaska State Medical Association's sponsored professional liability insurance company. It was started in 1975 by physicians who wanted to provide their colleagues with a stable, secure source of reasonably priced malpractice coverage.

For more information about MIEC or its rates, contact ASMA at 907-562-2662 or MIEC toll free, 800-227-4527.

DATE: _____ TIME: _____ CALL TAKEN BY: _____

FOR: _____ CALLER: _____

PHONE: _____ PATIENT NAME (IF NOT CALLER): _____

MESSAGE:

ACTION:

O FILE

Reach Out and Recruit — Peer-to-Peer Campaign

Please reproduce the Membership Application on the facing page and take just five minutes to talk to a nonmember colleague about the advantages of membership in their state medical association. If 100% of the Alaskan physicians were members, the voice of organized medicine would surely be heard.

Some physicians say the price of membership is too high, well, it is for the members. But if **all** the physicians were members the cost of membership could possibly be reduced. Take a minute and talk with a nonmember about membership! ! ! The following is just two of the popular benefits — there are more. Call the ASMA office for more information - 562-2662.

Cellular Phone Service for ASMA members!

The Alaska State Medical Association, in conjunction with MACtel Cellular System, has developed a group plan that will lower your air-time rates sharply.

- *annual ASMA administrative fee of only \$120.00 per phone, billed at \$10 per month with your bill for calls.*
- ***rates are now down to 20¢ per minute!** (Do some quick calculations and you'll see a savings of over 70% off your current rates)*
- *no minimum usage (billed monthly for usage only)*
- *call forwarding —>*
- *call waiting —> Two of these (your choice) at no extra charge!*
- *3-way calling —>*
- *All accounts must be in the member's name and paid monthly by the member (Checks from non-members will not be accepted)*

If you would like to get in on this exciting plan, contact Cellular World - 522-7877.

DocPlan

For participating ASMA member physicians, their employees and dependents DocPlan includes:

- Mandatory coverages: Medical, Group Life Insurance and Accidental Death & Dismemberment (AD&D), Dependent Group Life Insurance
- Elective coverages: Dental and Vision

**Don't miss out on these spectacular money-saving
benefits of ASMA membership! ! !**

Application for Membership

in the

**Alaska State Medical Association
4107 Laurel Street
Anchorage, Alaska 99508**

Date of Application _____

I am applying for membership in the Alaska State Medical Association as a ☐ Regular ☐ Associate
☐ Institutional ☐ Student member, and for membership in the:

- | | |
|--|---|
| <input type="checkbox"/> Anchorage Medical Society | <input type="checkbox"/> Ketchikan Medical Society |
| <input type="checkbox"/> Fairbanks Medical Association | <input type="checkbox"/> Matanuska-Susitna Medical Society |
| <input type="checkbox"/> Juneau Medical Society | <input type="checkbox"/> Sitka-Mt.Edgecumbe Medical Society |
| <input type="checkbox"/> Kachemak Bay Medical Society | <input type="checkbox"/> There is no local medical society in my area |
| <input type="checkbox"/> Kenai Peninsula Medical Society | |

Full Name _____

Date of Birth _____ Sex _____

Mailing Address _____

City _____ zip _____ Phone # _____

College of Medical Graduation _____ Year _____

AMA Medical Education Number _____

Year of Alaska License _____ Specialty _____

If elected into membership, I agree without reservation to conduct myself professionally and personally according to the Principles of Medical Ethics and to be governed by the Constitution and Bylaws of the Alaska State Medical Association.

----- Applicant's Signature -----

This application must be signed by two ASMA sponsoring members before submission to the ASMA office!

Sponsoring Members: We, the undersigned sponsors, support this physician's application to membership.

(print name)

(print name)

(signature)

(signature)

Please return this application and membership dues to ASMA, 4107 Laurel Street, Anchorage, AK 99508 (Fax 561-2063).

Failure to Document Telephone Calls Can Lead to Serious Injuries and Malpractice Claims

MIEC has a number of malpractice claims that could cost policyholders millions of dollars in settlement payments because the physicians involved could not prove they advised other physicians - or patients - of abnormal test result. In each of these cases, the physicians who claim to have made the telephone calls did not document the calls and could not recall to whom they spoke. Litigation in these cases has focused primarily on radiologists and pathologists who allegedly failed to report abnormal findings; however, general practitioners, emergency physicians, internists and others who maintain they were not informed about abnormal test results also have been sued and charged with failing to provide timely treatment. The following case, which illustrates how failing to document an important phone call can result in injury and litigation, is adapted with permission from the June, 1993 *Loss Minimizer*, a monthly supplement in the *Medical Liability Monitor* newsletter.

A 27-year-old woman was admitted to an emergency department midday following a fall from a porch. Skull and cervical spine films were taken. The emergency physician reviewed the films initially, interpreting them as negative for fracture. The X-rays were then returned to the radiology department where a radiologist examined them the same day and noted a possible displacement of a cervical vertebra. She called the emergency department to report the finding, and dictated a formal report. For reasons unknown, the radiologist's message did not reach either an emergency physician or the surgeon. The ED asked to admit and follow the patient. Subsequently, the patient became quadriplegic. The radiologist was unaware of the outcome of this case for many months after the incident. In the litigation that followed, the radiologist's defense was based on her claim that she had reported the cervical abnormality by telephone before she dictated her formal report which, due to a backlog, was transcribed three days later. The emergency physician denied receiving a phone call from the radiologist, but conceded that he does not usually document such phone calls, or calls to and from

private physicians. The radiologist did not know to whom she reported the abnormal finding, had not documented the fact that she called, and did not mention the call in her formal report. She said she doesn't ask the name of ED personnel to whom she might relay significant abnormal findings. All of the physicians were defendants in the lawsuit and contributed to a multimillion dollar settlement.

In cases like the example, in which medical care was delayed or not provided because of a communication gap, it is difficult to defend doctors who have conflicting recollections of what they said in an undocumented phone conversation to another physician or to a patient.

LOSS PREVENTION RECOMMENDATIONS

- Document significant telephone conversations with other physicians or patients. Physicians should consider as "significant" any phone calls in which they: (1) report abnormal test results to another physician or health professional, especially if prompt follow-up is required; (2) give advice to other physicians about management of a patient; or (3) receive information by phone from a patient about new complaints or symptoms, and in turn advise the patient what actions to take.
- Include in your documentation the time and date of phone calls, the name of the person who calls or whom you call, and a summary of the conversation. Avoid vague notes such as, "Notified emergency department of cervical fracture," or "Spoke to Dr. Smith." A more meaningful note might read, "U1/6/94 - 11:40 and Advised Dr. Smith in ED of possible displaced cervical fracture at C-6; recommended stat MRI. He said he'll arrange."
- Simplify documentation by using a standard message form that can be attached to the permanent medical record. MIEC's Loss Prevention Department can provide a camera-ready master of the phone message slip shown below.

(continued on page 10)

Sexually Speaking . . .

Psychosexual Aspects of Oncology

Mary Cavalier, MS⁽¹⁾

CASE ONE

A 47-year-old female with breast cancer undergoes surgery. After the surgery, she asks her doctor, "How can I be sexual again?" The doctor replies "Just get a sexy night gown." The patient feels frustrated by this response. The doctor feels frustrated by the question, because, after all, she is alive.

CASE TWO

When reviewing the risk of surgery with a 58-year-old male with prostate cancer, the doctor mentions the possibility of impotence. The doctor emphasizes the recovery rate and that the patient should feel fortunate that he caught the cancer early for it could be terminal. After about an hour of full discussion on the subject, the patient's response was "Impotence?" The doctor, irritated with the patient for it appeared that was the only thing the patient was hearing, said "Yes, but compared to your life, isn't that a minor side effect?" The patient feels diminished and shamed that he would focus on sex and not his life.

DISCUSSION

The human mind is a fascinating thing. One would think that when one is confronted with lifesaving surgery, that he/she would be grateful for life and not focus on details. But the mind sometimes takes things in pieces. It is much more manageable to focus on one's sex life than the overall picture of life and death. But it's this focus on a specific detail which sometimes frustrates doctors because they may not be taking into account the mind's ability to filter through, in degrees, intense information.

In case one, the patient's question went much deeper than appearing sexy. She finally accepted her

body after years of loathing it. Her self esteem has been dealt a major blow. She felt scared and out of control. If the doctor used active listening and reflected back concern such as "You are concerned about being sexual?" or "I hear your concern, would you like a referral to a counselor or to another survivor?" he would have developed a trust with the patient which would, in turn, improve treatment compliance and outcome.

The same holds true for case two. Of course, the patient heard how lucky he was for the early intervention, but he was also overwhelmed by the need to face potential death. What was manageable was a focus on sex. The doctor's response halted the potential of an in-depth patient-doctor relationship which could have lead to the patient not mentioning problems with treatment. This may sabotage treatment if the patient sensors out important information. Again, a reflective question such as "You're concerned about your sex life?" could relax the patient to explore ALL of the concerns he may have about the procedure.

CONCLUSION

I know many physicians shy away from getting into the emotional side of treatment. Using the techniques of reflective listening doesn't necessarily mean opening Pandora's box of touchy/feely stuff. What the physician does is, by validating the patient's concern regardless of the importance they may have for the physician, open the door for a honest professional relationship with the patient. The patient will feel free to express problems, side effects, and overall progress which may be critical for successful treatment. The price of not validating can be that the patient does not disclose all the problems, and therefore, inhibits the ability for the physician to administer treatment to it's fullest potential. Validation goes a long way in treatment!

(1) Mary B. Cavalier, M.Ed., Counselor, Educator, Private Practice.

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Glimpses of Alaskan Medical History

Edited by Robert Fortune, M.D.

An unexpected outcome (1865-67)

The Western Union International Telegraph Expedition was a gargantuan project which had its origins in the dreams of Perry McDonough Collins, a wealthy San Francisco promotor, who wanted to build a telegraph line through British Columbia and Alaska, across the Bering Strait, and thence across Siberia to the mouth of the Amur River. From there it could connect with the Russian system all the way to Europe. Surveying and construction of the line began in 1865, but a year later the project was doomed by the successful laying of the Atlantic cable.

One positive outcome of this project was the opportunity for several Americans to make notable explorations in Alaska, especially in the region around the lower Yukon and the Seward Peninsula, before the purchase in 1867. One of these was a 20-year-old man named George Russell Adams, who in 1865 portaged from Unalakleet to the Yukon River and thence up the river to Nulato, spending the next two years in the region. The episode quoted below comes from his account of these years.

Adams's experience with castor oil did not end with the Russian's wife. Only a week later, the Commandant himself became ill and implored him to prescribe some more of the castor oil that had done so much for his wife. Next morning the Russian was found dead, apparently of a heart attack.

"The day after the Koyukon chief came to see me the Commandant asked me to take a look at his wife, as he called her, a young Indian woman who, he said was very ill and that I might give her something to help her. I had seen the woman about the house and thought as she was quite emaciated that she was consumptive. I felt her pulse, which seemed to be strong and normal and her tongue was not coated but natural, and trying to look wise, told the Russian that I was sorry but that I did not have any medicine that was what she required.

"That evening he came again and implored me to give his wife something. He said that she had a good appetite but that her food did not give her strength.

All that I had in my "medicine chest" was a six ounce bottle of castor oil that I had for oiling my revolver. To stop the Russian's importunity, and thinking anyway it would do the woman no harm, I poured into a glass half-full of water, a third of my bottle of castor oil and took it to the woman. Accustomed as she was to fish oil, the castor oil doubtless seemed very mild. She drank it down as if she enjoyed it. At daylight the next morning I was awakened by the Commandant, who asked me to come and see his wife, as she was very sick.

"I dressed quickly and went to her. She was lying on the bed in the outer room and looked to me to be about done for. While I was feeling her pulse, which was strong and regular, the Russian, who had been summoned from the room, called excitedly to me to come to him, and upon going outside saw a passage of the woman that had been dumped on the snow, and that she had passed a tape-worm. With two sticks I strung the worm up along the side of the house on some pegs that were used for stretching skins, and measured it. It was thirteen feet and six inches long and all there.

"Triumphantly I told the Russian that his wife would now get well and to give her some tea. By noon she was up and eating a fish soup dinner, and in a couple of days had improved so much in appearance and liveliness that, whereas I had thought her a middle-aged woman, I saw now that she was but a girl of about eighteen."

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From Out of the Past...

Gloria Park, M.D.

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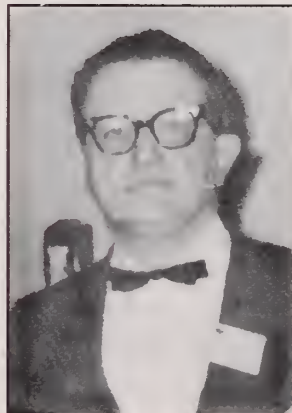
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E. S. Rabeau, M.D., and Joseph Shelton, M.D.

Presentation to Dr. Joseph Shelton

by E. S. Rabeau, M.D.

On occasion, the Division of Indian Health of the U.S. Public Health Service awards a special certificate of appreciation to an individual who has contributed significantly through professional assistance and guidance to the division goal of raising the health of the American Indian and Alaska Native to the highest possible level.

Tonight, I have the honor to present this certificate to Dr. Joseph Shelton, who has given so unselfishly of his time and talent in the field of sight preservation and restoration for the benefit of the Alaska Native.

He has faithfully supported the division of Indian health as a consultant from the very beginning in 1955, devoting hours of his time to the clinical and surgical treatment of the native beneficiaries far beyond the normal duties or expectations.

Without his able assistance over the years, many an Alaska Native could not have seen to hunt for food, his wife could not have seen to sew; and his children could not have seen to read and learn. In the early days when our staffing at the Anchorage hospital was so limited, he was

regularly on call. And, it was through his excellent teaching that our field physicians learned refraction techniques. His three day ophthalmology course is something of a legend among those physicians who have worked in Alaska at the service unit level. He is still providing his expert consultation. Dr. Shelton epitomizes the great services we receive from our many excellent professional consultants, and, as we pay homage to him, we are also acknowledging a debt to all these fine men who give so unstintingly of their time and knowledge. Our program would suffer without them.

I feel especially privileged to be able to express the Public Health Service's appreciation to Dr. Shelton, for I am personally very well acquainted, over a long number of years, with his deep compassion for his patients and with the extensive contributions he has made to the Alaska Native health program.

Dr. Shelton — this award is made only to a few. Please accept it with our most sincere gratitude.

Excerpted from *Alaska Medicine*, Volume 9, Number 3, page 85

[The following is excerpts from "The Legislature Will Get You If You Don't Watch Out!"]

REPORT ON TRIP TO JUNEAU

Milo Fritz, MD

The question most frequently asked me was, "What are you doing in the legislature? During the seventy-four days in Juneau, where I served in the House of Representatives along with Mike Beirne, I often asked myself the same question.

The Drive to Juneau

I rented an Air-Stream motor home in order to test out the feasibility of this as a place in which to live, not only during the session of the legislature, but also for the clinics that I hold twice a year in Southeastern Alaska.

Mr. John Spahn helped me drive this bus over the Chilkat Pass on the 18th of January. It was just exactly like driving around in one's deepfreeze. The little furnace was never designed to heat this monstrous body over twenty-eight feet in length, and six feet high, and about six feet wide. Everything but the windshield in front of our faces, was coated with a half-inch of ice. We wore arctic underwear, parkas, and fleece-lined boots, and nevertheless were cold. The temperature inside the cockpit got down to 20 degrees below zero. The only warm place in the entire bus, besides the engine, was the refrigerator!

The second night out, the temperature got down to 38 degrees below zero. When we started up the engine, we could just barely turn the wheel in spite of power steering assist. Eventually we got over Chilkat Pass, white and forbidding, down to Haines where the temperature rose above freezing, and we felt positively tropical after the two days of subzero driving.

Life in Juneau

In Juneau, I parked the bus in the section of Juneau near the new Federal Building. As some of you may recall, they had the highest winds, the greatest snowfall, and the lowest temperatures ever experienced in Juneau. The old bus bucked



Milo H. Fritz, M.D.

and kicked and some of the high winds made me afraid it might actually be blown over.

The bus was about three-quarters mile from the Capitol. It was possible for me to get in about five miles of walking a day. This is a very important item when one had to spend most of his time on his backside either in committee meetings, in sessions of the House, or standing in front of the snacks and hors d'oeuvres at the receptions held by the various groups in the hospitable city of Juneau, during the time that the legislature is in session.

The people of Juneau made us welcome with placards, that allowed us to park where we could during the first few days until we could find permanent places for our vehicles. The banks offered us their facilities at no charge.

JACK W. GIBSON, M. D.

1924-1967

By Henry Wilde, M.D.



The sudden death of Jack W. Gibson of coronary thrombosis during a brief vacation in Seattle on July 16, 1967 not only deprived Juneau of one of its pioneer physicians but brought to an end a definite epoch of Juneau Medicine. Doctor Gibson was the last remaining founding member of the New Juneau Clinic; together with Doctors W. Blanton, C. C. Carter and W. Whitehead who had passed away previously. Design and organization of the Juneau Clinic building at 188 South Franklin Street in 1957 was to a large extent his work. The high standard of practice at this institution was not to a small measure due to his continuing interest in clinical and laboratory advances. Though mainly a pediatrician and as such a "doctor's doctor", Jack was also interested and active in the broad field of medicine. He was instrumental in organizing in 1959 a University of Washington affiliated clinical clerkship program at St. Ann's Hospital, Juneau which resulted, for some time, in close liaison with that excellent institution. His interesting pediatric case presentations at St. Ann's Hospital staff meetings, especially in the years 1959-63, will be recalled by his friends and associates, for most of whom he also served as a devoted family pediatrician.

Doctor Gibson was an Oregonian, born in 1924 and educated at Willamette College at Salem and Creighton University School of Medicine, Omaha, Nebraska. He served a short time in the U. S. Navy at the end of World War II and had

postgraduate training at Providence Hospital, Portland and later at the Royal Institute of Child Health, Great Ormond Street Hospital, London, where he was awarded the Diploma in Child Health. Jack held many honorary offices in medical organizations, among which were: Secretary of the Alaska Board of Basic Science Examiners, Councilor of the Alaska State Medical Association, Director of the Division of Maternal and Child Health of the Alaska Division of Health and Welfare, President of the Juneau and District Medical Society and of St. Ann's Hospital Medical Staff.

Doctor Gibson's private life was not without tragedy. His youngest son Shawn died suddenly of vomiting and aspiration while Doctor Gibson was making a house call. His first wife Virginia, whom he married as a college student, and who was one of Juneau's most beloved matrons, died in 1962 of the syndrome of bone marrow aplasia following infectious hepatitis. His second marriage ended in divorce but he was able to establish once more a happy home for his 3 remaining sons Randy, Dena and Dilan when, in September of 1965, he married Nola Kathleen Roberts, a Juneau teacher and social worker.

Jack W. Gibson will not so soon be forgotten. He was a man who, along with such pioneer physicians as Simpson, Daws, Council, Clemens, Blanton, Carter and Whitehead, left a lasting imprint on the Juneau scene and in the minds of his many friends, patients and colleagues.

Excerpted from *Alaska Medicine*, Volume 9, Number 3, page 80.

LESTER HAROLD MARGETTS, Jr., M. D.

Born: Spokane, Washington—May 14, 1922

Died: Anchorage, Alaska—January 31, 1967

Surgeon, gentleman, friend, all these were Les Margetts, and much more. He was cheerful and straightforward in all his relations with life. We will not be blessed with his like again. He was gifted with remarkable calmness during moments of emergency, in surgery and in all facets of life. Actually, in time of vital emergency he was unusually good natured—more so than during the trivial irritations we all face day to day. In surgery this gift was well known to all his contemporaries; in regards to other occasions may I mention the following incident. It occurred one threatening, dark and brooding evening on our return from Ugashik. Lake Clark Pass was closed. Jack Jefford, pilot and mutual friend, decided we would try flying through Bruin Bay. Ceilings were low and the wind became more awesome and turbulent with each passing of jagged peak and storm gashed bay. Seat belts were tightened as to almost interrupt circulation and straps grasped until knuckles were white. The plane was tossed about as a bubble in freshly opened champagne. The wings now up, soon down, rarely level—stopped on each oscillation with a terrifying clump. Les remarked on this occasion, "Wouldn't you think a pilot of Jack's experience and ability could fly this ship without flapping the wings like a beheaded eagle."

Les Margetts was a staunch, easy fitting and enduring friend—brave, manly, honest, understanding, kind and learned. His death is a personal, profound loss to all who called him friend. He died too soon, at the zenith of his fine work, and in full possession of his unusual talents, doing his best work—a splendid, irreplaceable example for each of us. Had he lived longer, surely his gifts would have made him known beyond Alaska. He had many surgical firsts in Alaska and these were successful more because of his talents, courage and calmness than by reason of numbers of trained team members or white tower equipment.

He was not deeply opinionated—he had great respect for the views of others. His thoughts and his alone were not infallible—he could and did compromise. If his diagnosis was not correct or his treatment erroneous, he would frankly admit the mistake and did courageously strive to prevent a recurrence. A great and respected gift this, and one to be earnestly



Dr. Les Margetts

cultivated by each of us. Les was capable of open, bitter, and ample criticism of any who fostered injustice. He quarreled, but always wisely and never from pettiness or jealousy. In medical meetings he took a leading place, he was frank, forceful and literate in discussion, and the more he was stirred, the more logical, cold and biting were his remarks. He was devastatingly truthful in meetings as at all other times. The truth would [come] out even when most unpalatable. No actor, facts to him were unalterable.

No thoughts of Les could be complete without mention of at least one of the innumerable personal incidents in my relations with this man I could so proudly call a friend. Shortly after Les arrived in Alaska, he and I were hunting ducks over on the Susitna flats. It was a warm day recently bright but now dulled to a pink haze in the evening sun. We chatted side by side on a gray, gritty, tide-tossed log—now stranded by the ebbing tide. A flight of low flying Mallards interrupted us, alas too late. They approached like a formation of Delta winged jets and as soon were overhead. Our shotguns followed and were discharged as the flight passed beyond our backs. No birds fell. Unbalanced, Les and I were still side by side but now half submerged in a gray volcanic and organic sludge. He commented: "Say' That air to ground stuff is potent today."

Carry on, Les—Friend, Man and Surgeon—until we who follow may also comprehend the secret of life which only death can reveal.

DR. WILLIAM H. CHASE: PHYSICIAN — PIONEER

JOSEPH A. TEDESCO, H.D.
CORDOVA

The year 1874 to Alemeda and Leander Chase was an eventful one with the addition of a new baby boy to the family. Little did they realize how eventful it really was for their son William H. Chase was to become one of the foremost pioneers of early Alaska.

His parents were both of French ancestry but were born in the United States. His mother and father were both natives of New York. At the time of Will's birth (as he was called for short) they were living in New York in the city of Warsaw.

His boyhood days patterned his later years. Much of his early activity centered around outdoor pursuits. His grandfather raised trotting horses in upper New York State and whenever possible his grandson would visit his ranch and engage in many of the activities associated with it. Other factors which probably played a major role in arousing the adventurous wanderlust spirit of our subject were born out of the family problems which tormented his boyhood days. As a result of this he decided it would be best for him if he left home, and at the age of 18, in 1892, upon completion of his schooling he set out to seek a more satisfactory existence.

He had heard often that New York City was a place of opportunity where one could seek his fortune and that was enough to make this city his new home. As we can see young Chase was early beginning to show signs of a man of his own convictions. He was soon to learn that to find one's fortune was not quite as easy as he suspected and that you couldn't get to the top by beginning there. By chance his first job was a clerk in a drug store, at the time he thought a rather long way from the top, and this is where his interest in the medical field began.



Dr. William H. Chase

At first finances were a hindrance but with budgeting his money and working during the evenings he decided to go further and put himself through a two-year course in Mills Training School for Male Nurses. During the course of his schooling while working in the drug store he and some friends went to the Chicago World's Fair. Here he met an old story-telling miner from the Yukon. Chase, being young and adventurous, was an eager listener. Subsequently several letters between this sourdough and Chase rekindled his adventurous urge but he wasn't ready yet to leave New York.

After graduating he accepted a job as a male nurse at Bellevue Hospital. His interests here were gradually growing and considerably more

stable than the picture drawn by his northern friend. He knew well that to get ahead required perseverance. This was exemplified by a second important decision. Chase decided to continue his evening studies in the Eclectic Medical Training School while pursuing a nursing career during the day.

Here they covered a variety of subjects; during the first year anatomy, physiology and chemistry. Following this a student could choose from one of the specialties. Young Chase chose obstetrics as his field. During the ensuing years he followed this endeavor and in 1897 graduated in a class of fourteen.

He was anxious to see the north we know but to go alone relatively inexperienced as a physician was an appalling thought. Consequently he decided to work in the Bellevue Hospital as a physician and accumulate needed experience. So for the next few months, he listened at conferences, studied autopsy material, and learned the essentials of administering anesthetics.

Finally the time had come, and in 1897, Doctor Chase alone headed by way of the west coast to the north. He made it to Skagway without seeing anything more than a sore throat or a toothache. As we might expect, this wasn't to last. One day while passengers were embarking to Skagway from the old Queen (a 600-foot passenger ship) via skiff to shore. One of her Australian passengers slipped from the steep gangway and landed straddling his perineum on the skiff's gunwale. To say the least, his perineum suffered as did his urethra. After a good deal of trouble getting the man to shore and setting up a tent operating room, Doctor Chase, using ether anesthesia, performed a suprapubic cystostomy, sutured the perineal laceration, and inserted a urethral catheter. Unfortunately, there were no means for extensive postoperative care or follow-up, but by word of mouth it was learned, several weeks later, that the patient had fully recovered.

So as practicing surgeon and anesthesiologist, Doctor Chase moved north along the Skagway trail toward Dawson. He remembers numerous stories of hardship on this trek. He was an observer of an epidemic of meningitis which

occurred between Skagway and the Canadian border. Unable to do a great deal medically, he saw many men die during this siege. Doctor Chase remembers passing some fifty ill individuals camping beside the trail, victims of then an incurable disease.

On the more encouraging side, along this perilous trail in a place called Sheep's Camp, Doctor Chase was to perform his first appendectomy. This, too, was a tent procedure. The patient involved was unfortunate enough to have a ruptured appendix, adding difficulties on top of those already present. A solution of ether and sterile water was used to wash the peritoneal cavity and the interior portion of the wound was left open to facilitate drainage. The patient made an uneventful recovery.

The town of Dawson partly satisfied Doctor Chase's wandering urge, for he stayed there almost two years. He found time to be half miner and half physician. Whenever he wasn't working professionally, he was out searching for gold. As a physician, he made calls twenty to thirty miles away often on dog sled. As a prospector, he covered a good deal of northeastern Alaska. After completing some prospecting in the Tanana River area, his travels took him to Fairbanks where he practiced medicine for a short period of time.

Late in 1906 and early in 1907, Doctor Chase met Doctor Romig, Sr., who was then a Moravian Missionary in Bethel, running a small missionary hospital. Together they were the first in Alaska to set fees for appearing in court and to begin the first Alaska Medical Association with Doctor Romig as president and Doctor Chase as secretary. They also were the first to perform postmortems for the third judicial courts in Valdez.

In the spring of 1907 Doctor Chase went to Katella and spent the following summer and winter searching for oil.

His next move brought him to Cordova. It was May 8, 1908, when he and Doctor Council became the two physicians of this prosperous little coastal town. They set up a hospital in an abandoned cannery located in what is today

called old town. During the two years they remained in this building one event is noteworthy of mentioning. It seems that the iron man of "Seward's ice box", Tony Dimond, owes some of his success to an incident which happened in the vicinity of Cordova. He, for reasons unknown to the author and probably to Mr. Dimond, shot himself accidentally in the right leg, breaking his femur in several places. This event introduced Mr. Dimond as a patient to Dr. Chase and resulted in his spending the better part of a year in Cordova's first makeshift hospital. While there, he intensely pursued the study of law, leading him eventually to a degree in law, and subsequently to the position of district judge in Anchorage and in time, to be elected numerous times as Alaska's delegate to Congress.

In 1909, Doctor Chase was appointed Alaska's first health commissioner by Governor Strong. His duties consisted of inspecting all incoming ships for the presence of contagious diseases. During the time he served in this capacity it is of interest that he uncovered only three cases of smallpox and two of typhoid fever. He was also responsible for seeing to it that there was a reasonable semblance of sanitary facilities in town, a job he entertains today as the local health officer.

In 1925 he was invited to Washington by Doctor Nelson, Chief of the U. S. Biological Survey, to speak as an authority on Alaska. Doctor Chase, at that time, was, and still is, respected for his knowledge of the territory. While in Washington on this occasion, he had aspirations of becoming game commissioner instead of health commissioner due to strong interests in the preservation of Alaska's wildlife. After some to-do about being able to hold only one appointment, Washington consented to make him commissioner of both game and native health.

Cordova's second hospital was built by Doctor Chase and Doctor Council for six thousand dollars. This provided eight beds, nursing quarters for two, and an operating room. Some of the equipment was built locally, the remainder purchased from the states, and as a result, Cordova, for the first time, had a fairly well-equipped facility. A second appendectomy by Chase was preformed here with success and several Caesar-

ean sections were done by Doctor Council assisted by Doctor Chase. Both men were busied with the every day medical needs of the town, some difficult, most routine, and some annoying. For instance, Doctor Chase remembers the time on the 4th of July in 1920, when he was in charge of all the local festivities and was plagued with the obstetrical problems, in this case three, one a preacher's wife, another a nurse, and a third, a native girl.

Many of us recall the influenza epidemic of 1919. Doctor Chase remembers it, I am sure, better than most. It seems Cordova had sixty-five cases, necessitating quarantining the town and setting up one of the local cannery buildings as an emergency hospital. With hard work, fatalities were limited to one. This happened to be an individual who was ignoring his ill health by consuming quantities of the local spirited beverages. As a result, Cordova had to do without a dentist for a short while.

During this same period, the Kennecott Copper Mines were in full swing and on an occasion during the winter when their physician was ill, Doctor Chase was called to Chitina to fill in until he recovered. One stormy evening when the river had all but washed out the Chitina river railroad bridge, leaving only the rails supporting the two ends, there was an accident at the mine. They sent an engine to get help. Doctor Chase had to crawl across the twisted track to the far side to be rushed to the survivors.

Some of the many other accomplishments Doctor Chase has crowded into his long life are more than twenty terms as mayor of Cordova. Two terms as territorial delegate to the Republican Convention, and the authorship of eight books. Besides writing the *Sourdough Pot*, *Alaska's Mammoth Brown Bear*, *Reminiscences of Captain Billy Moore*, and others, he has written several articles for leading sporting magazines.

Today at eighty-six, he can frequently be seen walking the streets, responding to the call of those who need him, and, I am sure, thinking in the back of his mind that one of these days this land he worked so hard for is going to be the greatest state.

DR. WILL H. CHASE 1874-1964

By Howard G. Romig, M.D.

As chance would have it Dr. Will H. Chase and my dad, Dr. J. H. Romig, returned to Alaska in 1906 on the same sailing vessel, The Star of Finland, owned by the Alaska Packers Association. For Dr. Romig this second go in Alaska was occasioned by the Great Fire of San Francisco which had wiped out his newly established medical practice. For the younger Dr. Chase, who first came to Alaska on the Dyea (Klondike) Trail in 1897, it was another wonderful adventure and he was full of vigor and enthusiasm.

On arrival in Alaska Dr. Chase entered the practice of medicine out of public necessity. His entire medical knowledge had been gained while a corpsman with the Army Medical Corps. By 1908 he had settled in Cordova. Here he remained in the practice of medicine until 1962, excluding three years in the Dawson-Yukon territory, one year in Fairbanks, one year in Katella, two years in upper Tanana, and six months in Nome, mostly prospecting.

In 1913 Alaska adopted the "Oregon Code" which gave license to all physicians then in practice under the "grandfather clause". Thus Will Chase became a "Doctor" by law, as did a lady practitioner in Fairbanks, who passed away there in the 1930s. Dr. Chase was long noted for his kindness and concern, especially for the poor and underprivileged. He many times put to shame his "superior" colleagues by ministering to "the natives" and all others wretched in spirit and body who were unable to find care elsewhere. He helped bring some 3000 babies into this world in the Cordova area, but was paid for only 150 of these deliveries. Many of Anchorage's present prominent citizens were delivered by this self-taught physician when their families lived in Cordova.

I have never heard a criticism of Dr. Chase that couldn't be attributed to professional jealousy, either on the part of a young doctor at-

tempting to start his practice in Cordova, or on the part of the older outdoorsmen who resented his fame. As an outdoorsman he was a rational figure. He wrote a dozen books on Alaska's wildlife and early pioneers, as well as countless newspaper and magazine articles. His books include "Alaska's Mammoth Brown Bears", "The Sourdough Pot", "Reminiscences of Captain Billie Moore", "Alaska- Her Requirements, Its Possibilities", "The Wolverine", "Man and Beast", "Nature Stories" and "The Trail Blazers of Bygone Days".

Dr. Chase became the first Alaska Territorial Health Commissioner and served eight years as Assistant Health Commissioner, 3rd Division. He was Medical Officer for the Bureau of Indian Affairs for 18 years, Medical Examiner under the Provost Marshall in World War I (1919), Game Commissioner on the Alaska Game Commission for its first six years, and Director of Civil Defense, Cordova area, World War II. He was six times elected Mayor of Cordova, first in 1910-11, and for the last time in 1954, for a total of 16 years in that office. He served as Cordova City Councilman for three years from 1950-1962, was elected Grand President of Pioneers of Alaska in 1938, and was a Past Exalted Ruler B.P.O. Elks No. 1483, Cordova. Born in 1874 in Warsaw, N.Y., he married three times, outliving all his wives.

In 1962 Dr. Will Chase left Cordova. By chance I was aboard the modern airliner with him. He never returned, spending his last years with an adopted daughter, Lorraine Chase Kelly, in Seattle. He passed on October 1, 1964 in Seattle. His memory will live long in Cordova in the hearts of many "old timers". He was a great man and a great physician.

Erratum...

Dear Editor:

It has come to my attention that there is an error in the economic calculations reported in the January-March, 1996 issue of *Alaska Medicine* (Schumacher, C: Smoking attributable mortality and economic costs in Alaska 1992-94. *Alaska Medicine* 1996;38:13-17). The error occurred when using the SAMMEC software to calculate "smoking related indirect mortality costs" which are the foregone wages and salaries for people who die prematurely from tobacco-related illnesses.

All of the other numbers in the article are correct, including the number of deaths caused by tobacco-related illnesses and the direct medical care costs (which are the actual payments to doctors, hospitals, pharmacies, nursing homes and other facilities for tobacco-related illnesses).

The correct numbers were obtained through consultation with the Centers for Disease Control and Prevention, Office on Smoking and Health, who repeated the calculations for us.

Table 5 should be:

The paragraph on page 16 entitled "economic costs" and the abstract should state:

...an indirect mortality cost of \$81.61 million and indirect morbidity cost of \$15.94 million. The total economic cost attributable to smoking related illness for 1993 is estimated at \$194 million.

The last sentence of the abstract and the first sentence of the discussion should be:

...economic costs of almost \$200 million per year.

I apologize for the error.

Catherine Schumacher, MD, MSPH
Chronic Disease Epidemiologist

Table 5:
Economic Costs of Smoking in Alaska: Estimates for 1993

Smoking related direct costs*	\$96,490,000
Smoking related indirect mortality costs**	\$81,614,000
Smoking related indirect morbidity costs	\$15,940,000
Total smoking related costs	\$194,044,000

*Calculation of direct costs based on 6.13% of total medical care costs for Alaska for 1993 (\$1,573,000,000)

**Indirect mortality costs calculated using SAMMEC with a 3% discount rate and 1990 earnings data

Letters to the Editor . . .

Dear Editor:

My name is Suzan E. Winders, Ph.D. I am an assistant professor of Medicine, Public Health and Psychology at the University of Alabama at Birmingham. My colleague, Jim Raczynski, Ph.D., and I were funded by the Robert Wood Johnson Foundation to disseminate smoking cessation materials for use by physicians with their pregnant and postpartum patients. Although our project has many facets, one goal has been the development and distribution of a catalog for physicians to order smoking cessation materials for their patients.

This goal is in keeping with the April 1996 publication by the Agency for Health Care Policy and Research (AHCPR). The publication states that pregnant smokers should be strongly encouraged to quit throughout pregnancy, because of the link between tobacco use and adverse pregnancy outcomes. As you probably know, the AHCPR publication identifies primary care clinicians as key to helping people quit smoking. The AHCPR strongly recommends that smokers be systematically identified, assessed, advised to quit and provided with appropriate motivational or self-help quit smoking material and other interventions as appropriate.

In order to compile the most useful catalog, we contacted over 350 individuals and organizations involved in smoking cessation. We received about 200 materials including complete self-help programs, booklets, pamphlets, posters and video tapes. All these materials were reviewed by experts in smoking cessation, health communication and cultural sensitivity. Some programs were reviewed by pregnant smokers.

The Wisconsin Clearinghouse of Prevention Materials will produce the commercial catalog. It will be ready for distribution in April 1997. The catalog features about twenty of the most highly rated programs and pamphlets. The material addresses smoking during pregnancy and postpartum smoking issues. It includes a variety of price ranges and items to suit many audiences. The catalog will be free to anyone who contracts Wisconsin Clearinghouse to request.

In order to reach as many primary care clinicians as possible, we are interested in promoting this catalog extensively. If you have more questions about the catalog or other facets of our project, please do not hesitate to contact my research assistant, Elizabeth Westfall, or me. Thank you for taking the time to consider this

project.

Suzan Winders, Ph.D.
Assistant Professor of Medicine
Public Health and Psychology

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Letters to the Editor . . .

STRONGYLOIDES CARDIOMYOPATHY

Dear Editor:

A middle-aged individual walks in your office and complains of shortness of breath. His recent past history consists of recurrent abdominal pains. He relates that he was treated previously with thiabendazole for worms. Suddenly it's *deja vu*. All those courses in human-related biology come to mind. All those days at the university and medical school studying biology, parasitology, and infectious diseases. One starts thinking that in a usual practice one encounters a parasitic problem occasionally such as pinworms, or a general nematosis. But this is a different instance. When you see patients in an international setting such as that of immigrants or travelers- the unusual occurs sometimes. If the individual is from West Africa, travels from an endemic region of nematosis, and it is discovered that eosinophilia is present along with abdominal pain—Strongyloidiasis comes to mind.

Strongyloidiasis is a disease endemic in the tropics, and a product of crowded conditions. Immediately, one looks up the life cycle, especially after stool for ova and parasites verify *Strongyloides stercoralis*. Then, one starts asking questions, and the patient starts remembering. Suddenly, he relates past pulmonary problems- states that he was told he had pneumonia, and was treated for it. Soon, he tells you that he really thought it peculiar that he had had pneumonia. He relates that he certainly had cough, nausea and vomiting, and diarrhea. Then, he recalls that he was told that his chest-x-ray was peculiar, but not really pneumonia. Soon, he recalls that after the so-called pneumonia, he felt weak. He was not sure if he had a heart attack. After a few days he was referred to a cardiologist because of shortness of breath. A chest-x-ray was taken, and the cardiologist described cardi-

omegaly attributed to the infestation. An ultrasound showed mitral and tricuspid regurgitation. He was placed on digoxin, and a diuretic, and felt better. He was told he was now hypertensive, had a mild murmur, and that the worm had played a major part in his cardiopulmonary disease. He was advised that the best description of his condition fit a *Strongyloides* cardiomyopathy. The physician described it, and the patient asked if this entity was similar to heartworms. He related that he dewormed his pet because of heartworms. The physician went on gingerly and politely to describe that it was not really the same connotation, but the anecdote helped to relate the findings. Usually Strongyloidiasis produced lung lesions. The patient stated that he felt good.

A few days later in the early morning hours, the patient developed severe shortness of breath and was hospitalized for decompensation of the heart failure. The chest-x-ray looked like any case of decompensated heart failure, prominent cardiomegaly, and pointed to a certain clinical desperation. A desire to do the most good as soon as possible.

There is a definite feeling that after all those years of training- those preliminary courses did not go for naught. In an immigration- related practice you treat the country and the world all at the same time. One realizes that Preventive Medicine and Public Health are at the crux of our struggle to relieve misery. This case reminded me of my biology teachers, and all the others that followed that took time and care to teach me to benefit others. Prevention is the key to control disagreeable outcomes.

Manuel A. Rodriguez, MD
Miami Lakes, FL 33014

Don't let them Suffer in Silence!

Talking to your patient about domestic violence: How to encourage them to talk to you

Abuse and battering by a loved one creates a sense of betrayal that results in an *inability to trust others*. This distrust may extend to the victim's physician. Your patients will be hesitant to talk to you but, it is important and helpful to ask questions when you suspect abuse.

Understand that, to a victim, when a doctor does not ask how an injury occurred, it is another sign that the violence must be the patient's fault and there is no help. Victims may not respond immediately and may not respond as you think they should, but you will have taken a very important, potentially life-saving step.

- **Ask in different ways.** Not all victims will respond to the same kinds of questions. Victims' perceptions of what constitutes abuse differ dramatically and many will not equate what is occurring with the term, "abuse".
- Maintain eye contact (when culturally correct).
- **Assume that any patient can be a victim** of domestic violence and that batterers can come from any family or economic background. The three professions with the highest abuse rates are law enforcement, law and medicine.
- It is important for the physician to recognize that victims are more than objects of abuse. **They are survivors.**

If you do suspect violence - Listen to your patients. Assure them that help is available for both them and their abusers. Ask if they are currently safe and provide them with resource information. Talk to your patients about your responsibility to report the abuse to law

enforcement if you are treating injuries which have resulted from that abuse. Remember that your patient may need time before she/he is ready to accept help.

First and foremost remember that **you do not have to fix the problem**. But you are in a unique position to help your patients by:

- 1) recognizing domestic violence;
- 2) treating the injuries; and
- 3) referring patients to sources of safety, advocacy and support.

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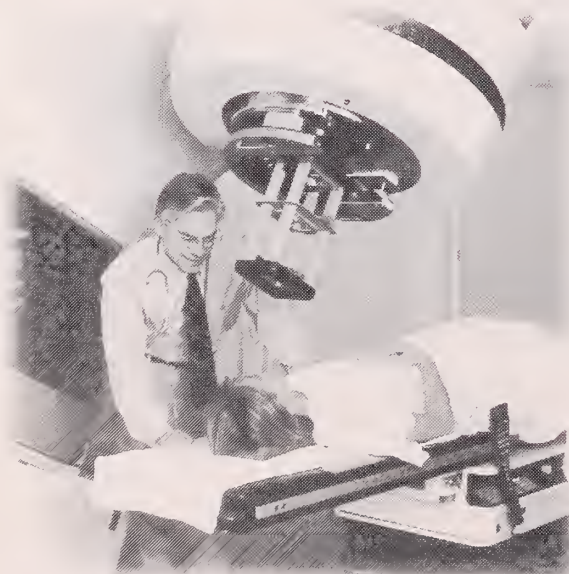
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and Kenneth W. Moss, MD*

*Expanding Use of Thrombolytic Therapy in the Treatment of Acute Myocardial
Infarction in Rural Alaskan Hospitals by Mary Ellen Gordian*

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Acute Appendicitis in Children in a Community Hospital: A Five Year Review

Iola Young, PA-S ⁽¹⁾
Kenneth W. Moss, MD ⁽²⁾

ABSTRACT

Objective: To review appendectomy cases in children at a small community hospital and to compare with experience at larger centers.

Design: A five-year retrospective study.

Setting: Bartlett Regional Hospital, Juneau, Alaska.

Patients and Methods: Records of children age 14 and younger who underwent appendectomy from 1991 through 1996 were reviewed; 79 charts were found. Cases were grouped as simple appendicitis, advanced appendicitis, and appendectomy without appendicitis. Variables considered included: length of symptoms at first contact, time from onset until surgery, presence or absence of classical symptoms, post-operative complications, length of hospital stay.

Results and Conclusion: 51 cases (64.6%) of simple appendicitis, 22 cases (27.9%) of advanced disease, and 6 cases (7.6%) of normal appendix occurred. Advanced disease was high (66.7%) in children less than 5, and low (22.7%) in ages 10-14. Parental delay >48 hours in seeking care was a significant factor in advanced disease, professional delay (time from first exam until surgery) was not. Post-surgical complications occurred in 7 (31.8%) cases of advanced disease and in none of the cases with simple appendicitis. Advanced disease cases had

an average hospital stay of 8.59 days (± 2.92) vs. 3.86 days (± 1.46) for simple appendicitis. Review of appendicitis in children at this hospital compared favorably with the experience at larger medical centers.

Acute appendicitis remains the most common abdominal surgical emergency in all age groups. It is estimated 7-12% of people develop this condition at some time of life. Though the incidence is highest in the second and third decade, it affects all ages (1-2). Approximately 80,000 children experience appendicitis in the United States annually at a rate of 4 per 1,000 in children younger than 14 years (3). Among children seen in the ambulatory care setting, appendicitis causes 2.3% of all abdominal pain episodes; and of those admitted, the etiology of approximately 32% is appendicitis (2). With advances in antibiotics and effective surgical management, the overall mortality rate of appendicitis has declined to less than 1% but the perforation rate with its attendant morbidity remains high. The overall risk of perforation ranges from 17% to 40%, with a median of 20% (1-2). It is alarmingly high in the very young patients who are especially vulnerable to the serious consequence of sepsis and post-operative abscess. The rate of perforation in children age 1 to 4 has been reported as high as 90% (4).

Several encounters with young patients with advanced disease and prolonged hospitalization prompted us to review our experience with appendicitis in children at Bartlett Regional Hospital (formerly Bartlett Memorial Hospital) in Juneau. Reviews of appendicitis in children have been published from large centers (4-8). We wished to compare the experience of a small Alaskan regional hospital serving a rural population with these studies. Sex and age distribution, presenting symptoms, factors

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influencing delay of diagnosis and treatment, complications, length of hospital stay and hospital costs were considered of interest.

MATERIALS AND METHODS

Bartlett Regional Hospital (BRH) is a 51 bed, JCAHO certified general medical and surgical hospital serving a regional population of about 50,000, and providing additional direct and supportive services for large numbers of cruise ship passengers and other tourists each year. There are 44 physicians on the active medical staff. Approximately 13,000 residents and visitors were seen as patients in the Emergency Department in 1995.

Records of all children ages 14 and under who underwent appendectomy at BRH during a 5-year period from January 1, 1991 through December 31, 1996 were reviewed; 79 charts were found (Figure 1). Thirteen variables were defined for each patient: Age, sex, day of illness at first medical contact, at admission and at surgery, presence or absence of

classical symptomatology, presence of pain localized to the right lower quadrant, white blood count, confounding symptoms or history, stage of disease at surgery, post-operative complications, length of stay, and hospital costs. Overall results are summarized in Table 1.

Acute appendicitis may be classified as simple, gangrenous, or perforated (1). Previous similar studies have found that children with gangrenous appendicitis experienced identical complications and clinical courses as children with perforated appendicitis (5-10). This study divided the 79 cases into diagnostic categories of simple appendicitis, advanced appendicitis, and appendectomy without appendicitis. Advanced appendicitis was deemed as rupture, localized collection of pus, an abscess, or diffuse spreading peritonitis confirmed by surgical findings and/or pathology report.

The method of statistical analysis used was the chi square test. A result was considered to be statistically significant if $p < .01$.

Figure 1.

Appendectomies at BRH Surgical Outcomes 1991-1996

Year	Normal Appendices	Simple Appendicitis	Advanced Disease	Total Cases per year
1991	3	8	6	17
1992	0	6	6	12
1993	1	8	0	9
1994	0	11	2	13
1995	0	8	3	11
1996	2	10	5	17
Total	6	51	22	79

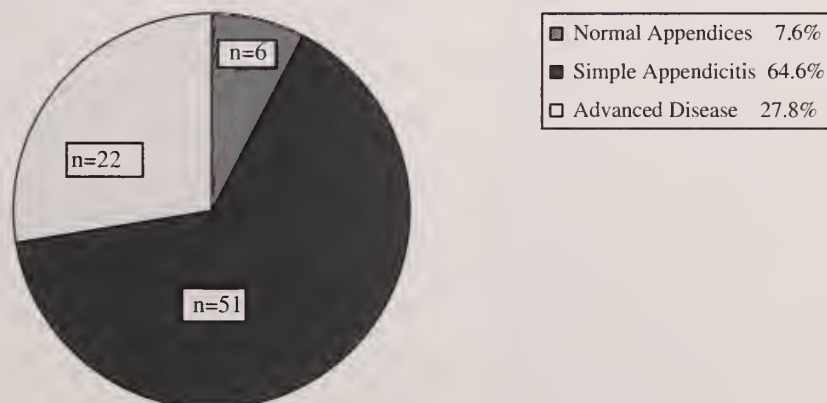


Table 1.

STUDY RESULTS

Study Parameter	Simple Appendicitis		Advanced Appendicitis	
Number of patients	51	69.9%	22	30.1%
Mean age	11.00 yr	(± 2.54)	9.50 yr	(± 3.65)
Sex				
Male	36	70.6%	12	54.6%
Female	15	29.4%	10	45.5%
Mean delay				
Onset to first contact	1.74 d	(± 0.89)	3.95 d	(± 2.55)
First contact to surgery	0.23 d	(± 0.50)	1.09 d	(± 2.36)
Total delay	1.98 d	(± 1.22)	4.90 d	(± 3.18)
Classic presentation	45	88.2%	14	63.6%
Pain localized to RLQ	48	94.1%	17	77.3%
Confounding hx or sx	11	21.6%	7	31.8%
Median WBC	15.63	(± 4.16)	18.99	(± 6.34)
Mean length of hospitalization				
Surgical Admit	3.86 d	(± 1.46)	8.59 d	(± 2.92)
Related readmission	n/a	---	4.80 d	(± 2.49)
Total hospital stay	3.86 d	(± 1.46)	9.68 d	(± 4.13)
Post-surgical complications	0	00.0%	7	31.8%
Mean hospital cost	\$4,932.59	($\pm 3,057.50$)	\$9,842.81	($\pm 3,547.32$)

RESULTS

There were 50 males (63.3%) and 29 females (36.7%) ranging in age from 20 months to 14 years. The peak age incidence was 13 years. The mean age was 10.35 years (standard deviation 3.07) years. There were 51 cases of simple appendicitis (64.6%), 22 cases of advanced disease (27.9%), and 6 cases of normal appendices (7.6%). The mean age of patients with advanced disease, was younger than those with simple appendicitis, 9.50 (± 3.65) compared to 11.00 (± 2.54) years.

The relationship of age to rate of perforation is shown in Figure 2. Although the incidence of appendicitis in children less than 5 years old was low ($n=3$), the perforation rate was 66.7%. As age increased, incidence of appendicitis also increased while the perforation rate fell. In children from 10 through 14 years of age the incidence of appendicitis was much higher ($n=53$) while perforation rates fell to 22.7%.

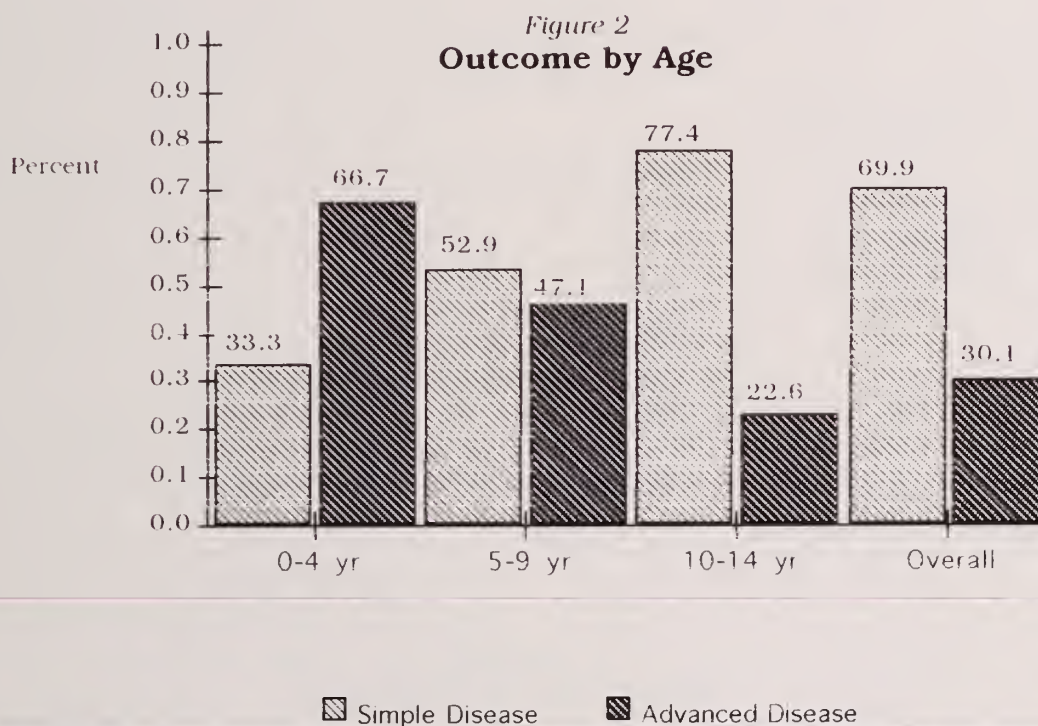
We examined the role of delay in treatment of appendicitis in several ways. The results are summarized in Figure 3. The first review was of total length of time from onset of symptoms to surgery. The increasing duration of symptoms was clearly associated with an increasing incidence of perforation or abscess formation. In patients with simple appendicitis the mean duration was 1.98 days (± 1.22), compared with 4.90 days (± 3.18) for those with advanced disease.

To determine if delay in treatment was due to patient/parent factors or professional factors, we divided the time interval into two categories. Patient/parental delay was defined as onset of symptoms to first medical contact and professional delay was the interval from first medical contact to surgery. It was found that 68.2% (15/22) of patients with advanced appendicitis contacted a health professional more than 48 hours after the onset of symptoms. The mean time to first contact for this group was 3.95 days, (± 2.55 , range 1 to 10 days).

Fewer patients with simple disease waited more than 48 hours to seek medical care following the onset of symptoms. Only 11.8% (6/51) waited beyond two days of illness before being seen by a professional health care provider. The mean time to first contact for this group was 1.74 days, (± 0.89 ; range 1 to 6 days). The patient who did not present until the sixth day of illness had a history of myelodysplasia complicated by bone marrow transplant and graft versus host disease 11 months prior to admission. When this patient was excluded, the mean time to first contact was shortened very slightly. Any delay exceeding 48 hours, whether from onset of symptoms to first medical contact or from onset to surgery, proved to be a statistically significant factor in the progression of appendicitis from simple acute to advanced disease ($p<.01$).

Figure 2**OUTCOME BY AGE**

Age	Number of cases	Simple Appendicitis		Advanced Appendicitis	
0-4 yr	3	1	33.3%	2	66.7%
5-9 yr	17	9	52.9%	8	47.1%
10-14 yr	53	41	77.4%	12	22.6%
Overall	73	51	69.9%	22	30.1%



Professional delay was examined in three different ways. We looked first at cases where the patient presented within 48 hours of illness onset but did not have surgery until after more than 48 hours had passed. None of the patients with limited pathology fit this criteria and only 2 (9.1%) of those with advanced disease did.

Another source of potential delay was discharge with a diagnosis unrelated to appendicitis at first contact with a health care professional. Again, this scenario was more prevalent in those with advanced disease when compared to those with simple disease; 5 (22.8%) versus 3 (5.9%). Discharge diagnoses for patients seen and discharged included: positive group A strep, sinusitis, bronchitis, dehydration, gastroenteritis, and muscular pain.

The third definition of professional delay tested related to surgery not being performed on the same

day as admit. This occurred in 10 cases of simple appendicitis (19.6%) and in 7 (31.8%) of those with advanced disease. Although delay in treatment is a determining factor in the final outcome of appendicitis, none of these three tests of professional delay proved to be a statistically significant difference between the two study groups.

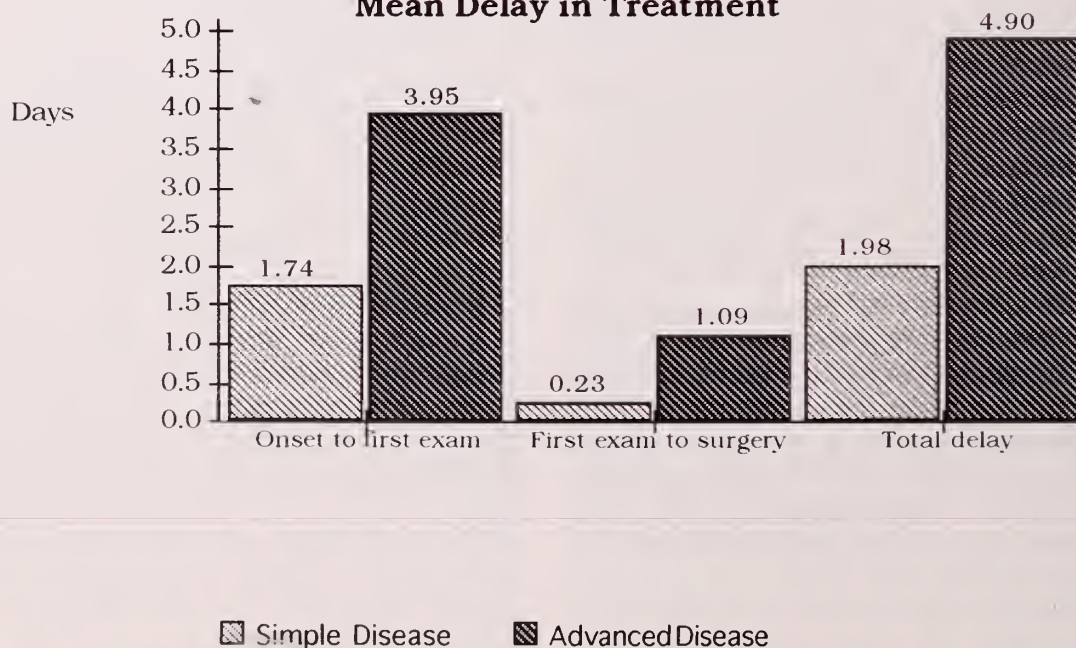
The classic sequence of symptoms in acute appendicitis has been defined as (1) pain at some site in the abdomen; (2) anorexia, nausea, or one to two episodes of vomiting; (3) pain over the appendix; and (4) fever (1-3, 11-13). If this pattern is present, diagnosis is not difficult. In our study this classic sequence was present in a majority of patients in both groups, 88.2% (45/51) of those with limited appendicitis and 63.6% (14/22) of those with extended pathology. Though absence of a classic presentation may make diagnosis difficult, it was not a statistically significant

Figure 3

DELAY IN TREATMENT

	Simple Appendicitis			Advanced Appendicitis		
Number of patients	51	69.6%		22	30.1%	
Mean delay			range			range
Onset to first contact	1.74 d	(±0.89)	1-6 d	3.95 d	(±2.55)	1-10 d
First contact to surgery	0.23 d	(±0.50)	1-2 d	1.09 d	(±2.36)	1-10 d
Total delay	1.98 d	(±1.22)	1-8 d	4.90 d	(±3.18)	1-13 d
Parental Delay						
definition: onset of symptoms to first exam						
>48 hrs	6	(11.8%)		15	(68.2%)	p<.01
Professional Delay						
definition: first exam ≤48 hrs but surgery delayed to						
>48 hrs	0	(00.0%)		2	(09.1%)	NS
Professional Delay						
definition: discharged with unrelated diagnosis at first						
contact	3	(05.9%)		5	(22.7%)	NS
Professional Delay						
definition: surgery not performed on same day as admit	10	(19.6%)		7	(31.8%)	NS
Total Delay						
definition: onset of symptoms to surgical resolution > 48 hrs	8	(15.7%)		17	(77.2%)	p<.01

Figure 3
Mean Delay in Treatment



cant factor in predicting the final diagnosis in this review. Examples of atypical presentation included: prolonged vomiting in a patient subsequently cultured for salmonella; a 1 year old who presented as fussy, vomiting, and with diarrhea for several days; prolonged vomiting and diarrhea with abdominal pain nearly resolving with fluid therapy; onset of illness with ear pain with fever while continuing to eat and drink without developing localized pain.

In 1996, Wagner (2) analyzed the accuracy of clinical presentation of appendicitis in adults by reviewing 300 articles and summarizing 10 of the highest quality studies based on number of patients studied, the study design, and completeness of reported data. This research found that right lower quadrant pain had the highest positive likelihood ratio across all studies. Gamal, (8) in a 4-1/2 year study of 230 patients aged 13 and younger, found that the single most important diagnostic finding was tenderness localized to the right lower quadrant. While our study found the incidence of pain localized to the right lower quadrant to be higher in children with simple appendicitis than those with advanced disease (94.1% versus 77.3%), the difference was not statistically significant. It was interesting to note that one patient had pain that remained in the right upper quadrant with no history of nausea, vomiting or diarrhea, yet the diagnosis of appendicitis was accurately made early in the disease process resulting in removal of an acutely inflamed ectopically located appendix.

Elevated white cell counts are highly sensitive for acute appendicitis, but the specificity is low (1). The reported average count is from 10,000 to 16,000 cells with a greater elevation being suggestive of perforations (8). There was a great deal of overlap in the range of WBC in both groups of patients in our study. The mean WBC in patients with limited disease in our study was $15.63 (\pm 4.16; \text{range } 3.5-27.3)$, and $18.99 (\pm 6.34; \text{range } 9.6-34.3)$ in those with advanced disease. In each group only one patient had a WBC less than 10,000; in the group with limited disease, that patient was 11 months post bone marrow transplant and graft versus host disease with a WBC of 4.16.

Associated illness, common in both simple and complicated appendicitis, can lead to a delay in presentation to or diagnosis by a physician (4). Perforation of the appendix has been found to be more frequent among patients with some other concomitant disease (14). Our study found a similar incidence of confounding history or symptoms in both diagnostic categories. Twenty-two percent (21.6%) of patients with early disease (11/51) had acute or chronic conditions. These included trauma

resulting in a contusion to the right pelvic bone, a recent history of giardia, myelodysplasia with graft versus host disease, personality disorder, recent positive PPD currently receiving treatment with INH. The incidence of confounding factors in patients with advanced disease was only slightly higher, 31.8% (7/22), and included positive salmonella, positive group A strep, dehydration due to prolonged vomiting, and upper respiratory infections.

Post-surgical complication rates for appendicitis in childhood years have remained high in many studies, and especially so in cases of perforations (4,7-9,15). Our study revealed that the rate of complications is a statistically significant difference between the two study groups. We defined post-surgical complication as any condition requiring additional diagnostic studies or treatment occurring during initial surgical admit, subsequent emergency room visit or re-admission. None of the patients with acute appendicitis fit this definition while 31.8% (7/22) of those with advanced disease experienced at least one post-operative complication. Complications included: post-hepatic fluid accumulation requiring drain placement, prolonged leukocytosis, prolonged fever, retro-colic abscess, bladder spasm, phlegmon, intra-abdominal abscess and adhesions requiring exploratory laparotomy, lysis and drain. Five patients were readmitted for three to eight days (mean $4.80 \text{ d} \pm 2.49$).

In this examination of appendectomies, the hospital stay was prolonged by an average of 4.73 days if the disease had extended beyond acute inflammation. In patients with advanced pathology, the mean hospital stay was more than twice as long as those with simple disease ($8.59 \pm 2.92 \text{ d}$ versus $3.86 \pm 1.46 \text{ d}$). The difference is even greater when hospitalization for related readmission is included ($9.68 \pm 4.13 \text{ d}$). Mean length of hospitalization is shown in Figure 4.

Hospitalization costs for simple appendicitis ranged from \$2,325 to \$24,563 with a mean of \$4,932.59 ($\pm 3,057.50$). These figures include the case that was complicated by myelodysplasia which had a cost more than five times greater than average of simple disease. The mean cost of hospitalization for advanced disease was nearly twice that of simple disease. The range of charges for advanced disease was from \$4,363 to \$18,395 with a mean of \$9,842.81 ($\pm 3,547.82$). This represents hospital costs only and does not include professional fees.

DISCUSSION

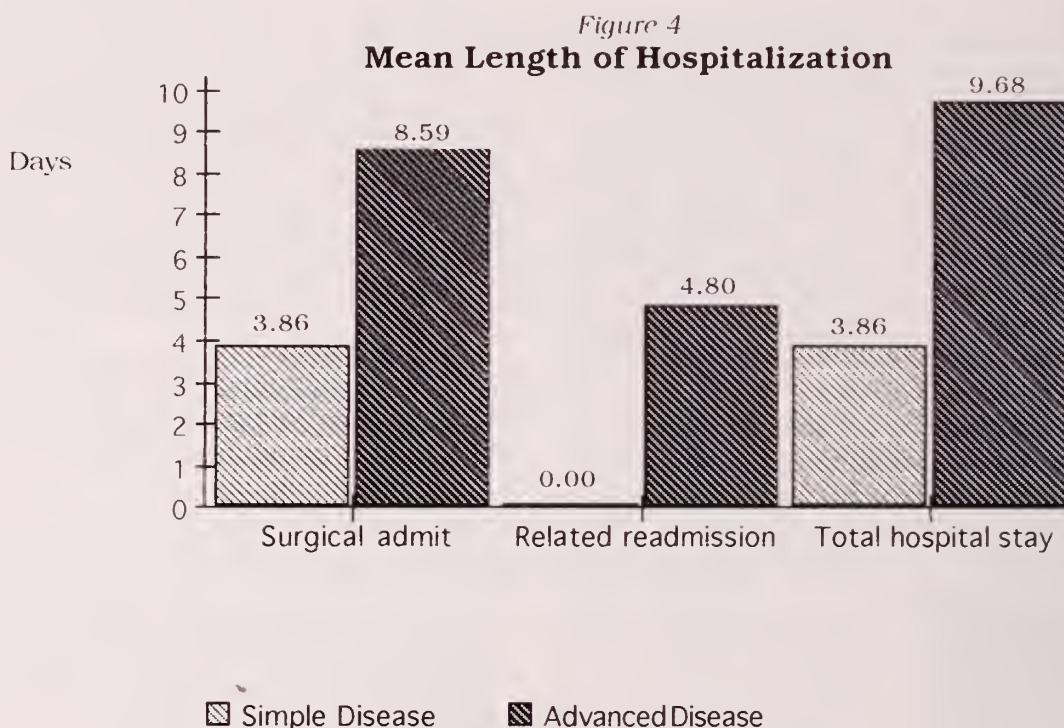
The experience of appendicitis in children age 13 and younger at Bartlett Regional Hospital in Juneau, Alaska, was remarkably similar to those studied in

Figure 4

LENGTH OF HOSPITALIZATION

Hospitalization in days	Simple Appendicitis			Advanced Appendicitis		
Surgical admit	3.86	(± 1.46)	range 2-12*	8.59	(± 2.92)	range 4-15
Related readmission	0	---		4.80	(± 2.49)	range 3-8
Total hospital stay	3.86	(± 1.46)	range 2-12*	9.68	(± 4.13)	range 4-19

* 12 day hospital stay is attributed to patient with history complicated by myelodysplasia, otherwise maximum hospital stay was 6 days.



much larger hospitals with far larger study groups. Of the 73 patients with positive pathology, 30.1% (22/73) had appendicitis that had progressed to rupture, abscess, or peritonitis. This compared very favorably to the rates ranging from 30.5 to 72.7% reported in five similar studies (4-8).

Researchers have commented on the acceptable rate of negative laparotomies believing that a certain number of negative explorations are necessary to avoid high incidence of perforation, even stating that perforation rates are generally inversely related to accuracy (1,9). Ravitch (12) wrote that "if you do not remove one normal appendix in five or six, you are waiting too long." By these standards, the 7.6% rate

of appendectomy with normal appendix at BRH is extraordinarily low while maintaining an equally low rate of perforation (27.9%). Three other studies (6-8) provide a basis of comparison with a 6.6% normal appendix rate and a 44.4% perforation rate, a rate of 4% normal with 47.0% perforated, and a rate of 1.5% normal and 30.5% perforation.

We found that the mean age of children with advanced disease was younger than that of children with limited pathology (9.50 versus 11.00 years). This same conclusion was reached by Chande (6) in a 1996 study of 259 patients. Other studies (4-7) have found a strong relationship between age and perforation concluding that the youngest children have the

highest rate of perforation and as age increases, perforation rate decreases. Although the number of patients age 5 and under in our study was significantly smaller than similar studies, the results were identical. Researchers have suggested that the increased perforation rate in younger children is due to a thin-walled appendix predisposing to early perforation. Others attribute the high perforation rate to an inability of the child to communicate, resulting in prolonged symptoms before diagnosis is made.

Males experienced a higher incidence of appendicitis but sex was not a significant factor in predicting the extent of disease. This conclusion is in agreement with studies that have examined this same parameter (5,7-8).

This research supports the common finding that the factor most predictive of perforation in children with acute appendicitis is delay in treatment (4-5,8). Our analysis of delay was conducted in a manner similar to a study conducted by Brender at Children's Orthopedic Hospital and Medical Center in Seattle (5). The result of each delay parameter in our study mirrored the Seattle experience. Total delay, delay attributed to patient or parent factors, and delay due to professional factors were notably longer for patients with perforated appendicitis. Brender found professional delay to be a significant factor in final outcome. Our study found parental delay to be a more significant determinant. This difference in conclusions is due to patients at BRH having a shorter mean time from first contact to surgery (.23 days for simple disease and 1.09 days for advanced disease) than patients at the larger metropolitan hospital (.44 days and 1.41 days respectively). The conflicting results are also attributable to a much longer period of time from onset to first contact in Juneau patients with advanced disease as compared to Seattle (3.95 versus 2.78 days).

Because BRH serves a number of small, outlying areas and is in a location accessible only by airplane or boat, the outcome of patients who were from areas other than Juneau was reviewed. It was very interesting to note that all of the patients with advanced disease came from Juneau, while eight of the patients with limited disease resided in Hoonah, Haines, Pelican, Wrangell, Skagway, or Yakutat. The records of five of these patients indicated that the first medical contact was in the village or community clinic with subsequent transport to Juneau for further evaluation and surgery. In children a high index of suspicion provides an opportunity to prevent perforation. We were pleased to see the health care professionals in the smaller outlying communities recognize the urgent necessity to act on this suspicion.

In finding that the presence or absence of typical presentation, pain localized to the right lower quad-

rant, confounding history or symptoms, or WBC elevation were not significant factors in predicting final outcome, our research conformed to those that also addressed these study questions.

Ravitch (12) defends an aggressive policy of operation on suspicion versus a delaying policy of operating only upon certainty in terms of pain, suffering, expense, nonlethal complications, and long-term consequences. In our study, we found a significantly increased rate of complications and length of hospital stay associated with advanced disease. The rate of complications in BRH patients (31.8%) greatly exceeds the rates reported in other studies of appendicitis in children (0.9% to 13.5%) (4,6-8). Part of this difference can be attributed to a broader definition of post-operative complication. Low rates reported in other research have also been credited to early aggressive use of broad-spectrum antibiotics in combination and delayed closure in the event of gross peritonitis (4,8). Putnam's (7) definition of complications was similar to the one used in this study and also looked at length of hospital stay. While that reported rate of complications was still astoundingly low in comparison (5.7% versus 31.8%), the length of hospital stay was not correspondingly low. In that study, patients with perforation and abscess had a mean hospital stay of 7.5 days, just one day less than our finding of 8.59 days for surgical admit. Putnam did not indicate if any of the 406 patients in his study required readmission for subsequent problems.

SUMMARY

The experience of appendicitis in children at Bartlett Regional Hospital compares favorably with that at larger medical centers but the incidence of perforation leading to an unacceptably high rate of complications and increased hospitalization indicates that there is room for improvement. Clearly delay in treatment leads to perforation and perforation happens sooner in younger patients. Several possible reasons for high perforation rates have been suggested: lack of parental recognition of the symptoms of appendicitis leading to delay in seeking examination by a physician, failure of the examining physician to make a correct diagnosis, delay in referral to or assessment by a surgeon, delay in initiation of the operation, and lack of access to care. Lack of insurance played a determining role in individual cases of advanced disease in this study but more research is necessary to objectively test that hypothesis. This study lends greatest support to the hypothesis that parental delay is a significant factor in perforation and warrants an education effort to raise the parental index of suspicion regarding abdominal pain in young children.

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Expanding Use of Thrombolytic Therapy in the Treatment of Acute Myocardial Infarction in Rural Alaskan Hospitals

Mary Ellen Gordian MD, MPH⁽¹⁾

Jane E. Ballard, PhD⁽²⁾

ABSTRACT

This paper focuses on clinical quality improvement comparing the results of two studies done approximately one year apart on treatment of acute myocardial infarction in four rural hospitals. The purpose of both studies was to determine how often eligible, elderly Medicare patients with acute myocardial infarction received thrombolytic treatment and aspirin. The studies were done by abstracting medical records for the calendar year 1993 and again in the year between October 1, 1994 and September 30, 1995. The results show that the use of thrombolytic therapy in these hospitals for the Medicare population increased by 40% between 1993 and 1995, a statistically significant increase (95% confidence intervals (CI) 20.1% to 60.0%). The rate of thrombolytic therapy among eligible Medicare patients went from 25.5% in 1993 to 65.7% in 1995. The use of aspirin also increased by 12.5% which was borderline significant (95% CI, 0.0% to 34%). The results were not as dramatic because the baseline for aspirin use with acute myocardial infarction was already 67.5% in 1993. These results indicate that the treatment of acute myocardial infarction is evolving closely in line with the American Heart Association/American College of Cardiology 1996 guidelines. Studies of clinical quality improvement such as this are now requirements for hospital certification.

INTRODUCTION

The rural hospitals included in this study were chosen because they are located in cities with less than 50,000 population and they had at least 20 AMI cases in a two year period. None of these hospitals have cardiac catheterization, intraaortic balloon,

percutaneous transluminal coronary angioplasty, or coronary artery bypass graft surgical capabilities available on site. The only reperfusion possibility available in these hospitals is pharmacological thrombolysis. The study was designed to help physicians and hospitals look objectively at their procedures and practices in order to optimize the quality of care delivered to patients. Individual hospitals receive their own data which they can compare to state-wide aggregate results.

BACKGROUND AND SIGNIFICANCE OF THROMBOLYTIC THERAPY

Acute myocardial infarction (AMI) is a leading cause of death in the Medicare population. In the last fifteen years, numerous randomized controlled clinical trials have established conclusively that reperfusion of coronary arteries by angioplasty or thrombolysis during AMI will reduce mortality and morbidity (1-3). The anti-platelet effect of aspirin administered early in the course of AMI has also been clearly established as beneficial to patients (4).

The value of thrombolytic treatment is time-dependent. Because the treatment involves breaking down blood clots that are already formed, the more rapidly therapy can begin the better the outcome. Breaking down blood clots can result in re-bleeding from previous injuries, so a history of significant bleeding within the preceding two to three weeks would be a contraindication to thrombolytic therapy. Intracranial bleeding which is not easily treatable can be a serious side effect of therapy. Any patient who has had a central nervous system event (stroke, or transient ischemic attack) is considered to be at increased risk for intracranial bleeding. Elderly patients are more prone to intracranial bleeding than younger patients. Net benefits have been demonstrated to patients presenting within the first 12 hours of symptom onset with ST-segment elevation or new

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bundle-branch block regardless of age, heart rate, or previous history of diabetes or previous MI (5). Patients treated in excess of 12 hours after onset of symptoms may benefit, although in clinical trials the benefits after 12 hours were not statistically significant. The 1996 American Heart Association guidelines recommends initiation of thrombolytic therapy within 30 minutes of the patient's arrival at the hospital (6).

Current data indicate that only patients with ST-segment elevation of ≥ 1 -2 mm in two contiguous leads or new bundle-branch block benefit from thrombolytic treatment. There is no evidence of benefit for thrombolytic therapy in patients with normal EKGs, ST depression with no reciprocal ST elevation, or T-wave changes only. No trials have demonstrated a benefit for thrombolytic therapy in unstable angina. In fact, because thrombolysis increases the risk of bleeding, using thrombolytics in patients with only ST segment depression slightly increases their mortality rate.

The decision to use thrombolytic therapy is based on a risk-benefit analysis for each individual situation. Patients with contraindications to thrombolytic therapy can be considered for alternative interventions such as angioplasty. Patients who have had previous coronary artery by-pass surgery are relatively resistant to thrombolytic therapy and should also be considered for direct angioplasty. While elderly patients often have relative contraindications to reperfusion with thrombolytic agents, physician judgment is important to assess risk/benefit as reduced mortality and morbidity has been demonstrated for elderly patients (2). There is no evidence to support withholding thrombolytic therapy solely on the basis of the patient's age.

METHODS

In the last quarter of 1994, PRO-West began a project to analyze the treatment of acute myocardial infarction (AMI) in four rural Alaskan hospitals using medical chart abstractions of elderly Medicare patients admitted during the 1993 calendar year (January 1, 1993 through December 31, 1993). The results of the first analysis was reported as a PRO-West monograph (1994) which was distributed to hospitals. In 1996, all of the Medicare hospital admissions for AMI that occurred between October 1, 1994, and September 30, 1995 in the same four rural Alaskan hospitals were abstracted.

Data were collected on all Medicare beneficiaries greater than or equal to 65 years old who were hospitalized with a primary discharge diagnosis of AMI (ICD-9CM 410.xx excluding those with a 2 in

the fifth digit) during the two study periods.

The charts were requested and the diagnoses were confirmed correct. There was a total of 82 patients admitted with the diagnosis of AMI in the first period and 135 patients in the second period. Each chart was abstracted by a nurse abstractor using the same abstraction instrument. Different abstractors were used in the two studies. A ten percent sample of charts was checked for reliability during both studies. Patients were considered eligible for thrombolytic therapy if they presented with ST segment elevation of ≥ 1 -2 mm in two contiguous leads of their EKG. Both physician notes and 12-lead EKG reports were examined. The physician notes were accepted if there was any discrepancy between the two sources. In the first time period 79.3% (65/82) of patients had EKG changes described that made them eligible for thrombolytic therapy. There were 30.7% (43/140) patients eligible in the second time period.

Table 1 is a compilation of conditions and lab values that were identified as possible contraindications to thrombolysis therapy. Patients who had any contraindication to thrombolytics noted in their medical charts were identified. Because individual patients vary, and physicians decide between absolute and relative contraindications for individual patients, a conservative approach was taken by eliminating patients with any contraindication. The total number of eligible patients likely to benefit from thrombolytic therapy and having none of

Table 1.
Contraindications for Thrombolytics
History of CVA (stroke)
Patient has DNR orders
Abnormal PT, INR, or platelet count
History of peptic ulcer disease
Uncontrolled hypertension (sBP >200 or dBP >120)
History of bleeding disorder
Current GI/internal bleeding
History of CVA known to be hemorrhagic
Hepatobiliary disease
Warfarin/Coumadin therapy at admission
CPR performed within past 24 hrs
Surgery or significant trauma in the past 2 weeks
Admission bilirubin > 2
Hemorrhagic eye condition
Recent CNS structural damage (eg. tumor, aneurysm)
Suspected aortic dissection
Active ulcer disease

the contraindications listed was 47 in the first time period and 35 in the second time period.

To calculate the timing of thrombolytic therapy, the time of arrival at the hospital was abstracted as well as the time that thrombolytic therapy was started. In the first time period, three charts did not document time; in the second time period, all charts documented time.

As there is no evidence of benefit for thrombolytic therapy in patients with normal EKGs, ST depression with no reciprocal ST elevation, nor T-wave changes only, these patients were not considered eligible for thrombolytic therapy, although they were eligible for aspirin if they had no aspirin allergy.

The use of aspirin given during hospitalization and at discharge was also abstracted. All patients diagnosed as AMI who survived the first 24 hrs regardless of EKG changes, are eligible to receive aspirin if they have no allergy to it and were included in the aspirin analysis.

The charts of AMI patients without aspirin allergy who were discharged alive were abstracted for aspirin recommended at discharge. The first time period included 76 patients eligible for aspirin during hospitalization and 67 eligible for aspirin at discharge. The second time period included 129 patients eligible for aspirin during hospitalization and 124 eligible at discharge.

Although it was not the purpose of this study to evaluate the association of thrombolytics with mortality, in-hospital case-fatality rates and average length of stay were also compared between 1993 and 1995. To maintain comparability of the groups these rates were calculated only for those patients eligible to receive thrombolytics in the two study periods.

Table 2.

Number of Deaths

Age Groups	1993	1995
65 - 79	3	1
70 - 74	1	0
75 - 79	3	1
80+	2	1
Overall Mortality	9	3

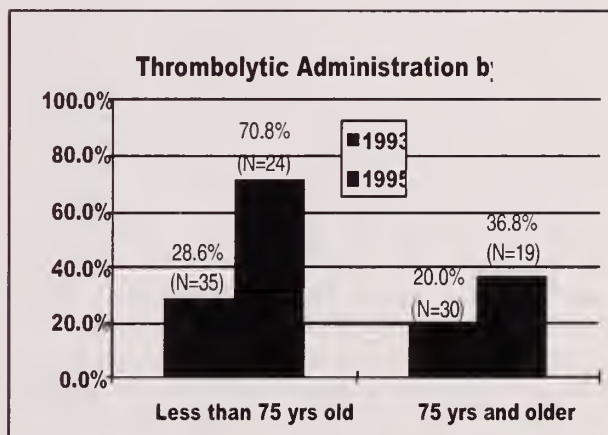
RESULTS

In the second time period the rate of thrombolytic therapy for patients eligible by EKG criteria was 55.8% (24/43). When all patients with any

contraindications were removed from the analysis, the rate increased to 65.7% (23/35). The corresponding rates in the first time period, were 24.6% (16/65) and 25.5% (12/47). Thus, over the nine month period between studies, there was a 31% statistically significant increase in thrombolytic therapy for eligible patients (95% CI, 13% to 49.4%). For patients without contraindications, there was a 40.2% statistically significant increase between study periods (95% CI, 20.1% to 60.2%).

The proportion of patients receiving thrombolytics within the first hour of arrival increased only slightly and was not statistically significant between time periods. In the first period 61.5% (16/24) of patients who received thrombolytics were started within 60 minutes of arrival; in the second period 66.7% (8/13) were started within 60 minutes.

When the use of thrombolytics was broken down by patient age, the improvement was shown to be in the treatment of 65-75 year old patients. In 1993, only 28.6% (10/35) of eligible Medicare patients less than 75 years old received thrombolytic therapy, but by 1995 the number of less than 75 year old eligible patients receiving therapy had risen to 70.8% (17/24). This increase of 42.3% is statistically significant for this age group (95% CI, 18.7% to 65.8%). In the over 75 year old group there was a 16.8% increase from 20% (6/30) in 1993 to 36.8% (7/19) which was not statistically significant (95% CI, -9.1% to 42.8%).



The number of patients receiving aspirin during their hospitalization also increased by 12.5% in the interim between studies (95% CI, 0% to 24.9%). In 1993, 67.5% (52/77) of these patients received aspirin during hospitalization. In 1995, 80% (108/135) of eligible patients received aspirin during hospitalization. Aspirin at discharge remained low and unchanged between time periods, 45.6% (31/68) in the first time period and 47.0% (61/130) in 1995.

While the age distribution of AMI patients eligible for thrombolytics remained stable, the case

fatality rate decreased from 20.9% to 7% between 1993 and 1995. However, the total number of deaths was small, nine in 1993 and three in 1995 so changes did not reach statistical significance. The average length of stay for patients eligible for thrombolytics also was reduced from 5.8 to 5.3 days.

DISCUSSION

This is a comparison of two studies done at different time periods. There has been a clear and significant improvement in the use of thrombolytic therapy for reperfusion in rural hospitals for elderly Medicare patients. From this study over 70% of Medicare patients between 65 and 75 years of age who presented at the hospital with heart attack symptoms and qualifying EKG changes in 1995 were treated with thrombolytic therapy. Although this study was not designed to accurately measure changes in mortality for these patients, the observed decrease in mortality while not reaching statistical significance was certainly in the right direction.

While the number of patients diagnosed with AMI increased considerably over the time period (82 to 135), the number of patients diagnosed with AMI who had ST segment elevation on their EKG was fairly constant (65 in 1993 and 43 in 1995). Because the denominator of all patients diagnosed with AMI increased between 1993 and 1995, the rate of patients diagnosed as AMI who had EKG changes making them eligible to receive thrombolytics changed significantly. In 1993, 84% of AMI patients had EKG changes making them eligible for thrombolytics, however in 1995 of all patients diagnosed with AMI only 32% had the significant EKG changes that would make them eligible for thrombolytic therapy. This could indicate a change in administrative coding for AMI as all patients were identified from a claims database (DRG creep). Since the comparisons for thrombolytic therapy are made only on those cases with documented EKG changes, expanding the diagnosis of AMI to include more cases without EKG changes would not affect the results. It is also possible that the abstraction instrument may have been interpreted differently by the two different abstractors in the two different time periods, however reliability testing was done during both time periods to eliminate any unrecognized systematic error in abstracting.

There is still opportunity for improvement in AMI treatment for these hospitals, but the improvements found between 1993 and 1995 indicate that hospitals in this group are working to improve the diagnosis and treatment of AMI. Post-discharge aspirin therapy for patients who have survived AMI is not being

adequately recommended. This is one area where physicians' and nurses' practice could be improved either by recommending low dose aspirin at discharge more often or documenting that they have done so.

To deliver thrombolytic therapy within 60 minutes of arrival time, hospital staff must work together as a team. Optimum outcomes are predicated on rapid and accurate diagnoses. Prompt identification can be facilitated by measures such as standing orders for 12-lead EKGs in all patients presenting with chest pain. Having EKG machines and thrombolytics always available in the Emergency Room (ER) have helped some hospitals reduce time to treatment.

The decision to use thrombolytic therapy must be made quickly and carried out quickly if the optimal benefit is to be obtained. Guidelines or protocols are extremely useful in organizing information to advise these decisions. Physician judgement is still an important factor. Every physician covering the ER should be familiar with the guidelines for thrombolytic therapy and every ER nurse should know how to administer and monitor thrombolytic infusions.

Reperfusion is now the standard of care for patients with acute myocardial infarction. Hospital efforts to focus on better recognition of potential candidates and eliminating unnecessary delays to treatment are important quality factors.

Monitoring treatment of AMI is likely to continue given the significance of this condition in the population and the importance of timely treatment. New quality indicators will be added to the abstraction instruments to delineate the use of other medications such as beta-blockers and ACE inhibitors in the first 24 hours, and discharge aspirin and beta-blockers which are preventive measures for optimum care.

ACKNOWLEDGEMENTS

We wish to acknowledge the work of Nancy Bilyeu at PRO-West/Alaska, and Christy Garrett at the Institute for Circumpolar Health Studies in preparing this work. We also thank James Moore, Greg Baumgardner, and Sandy Salinas at the PRO-West office in Seattle for their contribution to this study.

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(continued on page 63)

The AMA Physician's Recognition Award: A Tool for Your Education, Efficiency, and Success

Roger E. Sheldon, MD, MPH⁽¹⁾

The Physician's Recognition Award of the American Medical Association (AMA-PRA) is a poorly understood and under-utilized certification showing that a physician has completed a commendable amount of continuing medical education (CME) during the last 1, 2, or 3 years. Many different activities can earn credit toward the PRA—everything from full-scale designated CME courses to consulting with a colleague, analyzing your patients using a computer database, or reading "authoritative medical literature" in the comfort of your home or office. A number of options are available to every doctor, and every doctor should be able to earn a PRA.

Most MDs have not taken the time to record their credits and file the simple PRA application. But trends are afoot which will probably increase our interest and participation—perhaps to nearly 100%. Most hospitals, managed-care organizations and other health contractors are asking about CME hours and other CME activities. Physician databases (including the AMA "Physician Select" World Wide Web site (which probably already lists you along with your educational background) are already noting (in flashing symbols) that you have earned a PRA. More and more, the public is looking into these databases when selecting a physician.

The PRA will be your easiest and smoothest way to document the CME necessary for all these purposes.

The AMA-PRA combines all sorts of credits into one unified credential recognizing AMA Categories 1 and 2, American Academy of Family Physicians prescribed hours, American College of Obstetricians and Gynecologists cognates and independent credit hours of 9 other specialties and 5 local medical associations. Thus it provides a single certificate with which a physician may document CME for 1, 2, or 3 years.

(1) Dr. Sheldon is Professor of Pediatrics and Assistant Dean for Continuing Medical Education at the Irwin H. Brown Office of Continuing Medical Education at the OU College of Medicine, and Chair of the Accreditation Committee, Education Council, OSMA.

So What Do You Need to Know About the PRA?

Some basic requirements apply:

- All learning experiences must comply with the AMA definition of CME. (Content must relate *directly* to physicians' *professional* responsibilities.)
- All learning experiences must comply with AMA ethical opinions on Gifts to Physicians from Industry and on Ethical Issues in CME.
- Physicians must read authoritative medical literature an average of 2 hours per week.

The AMA, in keeping with its goal of making the PRA a recognition of physician-driven, comprehensive programs of education, recognizes most educational activities that individual physicians think are helpful to them. While most doctors claim mostly Category 1 hours from conventional CME meetings, Category 1 and 2 hours are available in many other ways. These include:

Category 1

- Formal CME activities (can be designated as either Category 1 or 2 by accredited providers).
- Journal-based CME (specific accredited articles with mail-in tests or evaluations).
- Accredited enduring materials (printed, audio- or videotape, computer-assisted programs, videodiscs, CD-ROMs). If a program of this sort is not designated for Category 1 hours, you may still be able to claim it as Category 2.
- Reciprocity with other medical education certificates.
- International meetings as approved and documented by the AMA.
- Recertification by an ABMS specialty board (a three-year PRA is granted).
- Full or part-time participation in an approved residency program (up to 50 hours of Category 1 per year).
- Study leading to medically related degrees (like the MPH or healthcare administration degrees).
- "Other meritorious learning experiences" as approved by the AMA.

Category 2 (largely physician-designated)

- Consultation with peers and experts concerning patients
- Use of electronic databases in patient care
- Small group discussions
- Self-assessment activities
- Journal club activities not designated as Category 1
- Medical writing
- Teleconferences
- Preceptorships
- Participating in formal peer review and quality assurance activities
- Preparation of educational exhibits
- Formal learning activities not designated as Category 1 or Category 2

Because of all these options and the physician-designated nature of Category 2, most physicians will find it easy to claim Category 2 hours. Category 1 may be harder for rural physicians, but more and more self-study offerings are becoming available, and Internet-based Category 1 is just around the corner. The *New England Journal of Medicine* offers up to 100 hours per year of Category 1 by reading designated articles and completing tests during the year. Other journals are following suite.

Two different PRA certificates are now available. The Standard Award requires 20 hours of Category 1 and a total of 50 hours per year. The “other” 30 hours can be either Category 1 or Category 2. In other words, “Category 2 hours, while highly recommended, are not required.”

Strong support for truly self-directed learning led to the creation of a second type of certificate. This “PRA with Commendation for Self-directed Learning” can be earned by physicians who determine their own learning needs relating to their professional responsibilities using a comprehensive program of self assessment and personally tailored CME of many types. It requires at least 20 hours of Category 1 and at least 20 hours of Category 2, again with a total requirement of 40 hours annually. Reading of authoritative medical literature is reportable hour-by-hour as Category 2 for the standard PRA, but *not* for the PRA with commendation. Applicants for both PRAs are required to affirm that they read the literature two hours per week on average.

More About the PRA

Details concerning all the provisions of the PRA are contained in the AMA-PRA Information Booklet

(dated January, 1997). You can get your copy and a PRA application form by calling the AMA at (312) 464-4665, by writing the PRA office at 515 North State Street, Chicago, Illinois 60610, or by accessing the AMA home page on the World Wide Web, <<http://www.ama-assn.org>>, and clicking to the CME page. A copy of the booklets is also available by contacting Sandy at the Alaska State Medical Association, (ASMA) phone (907)562-2662, or fax (907) 561-2063. Authoritative answers to questions about PRA requirements and the whole credit system are available at (312) 464-4665. The PRA fax number is (312) 464-4567.

How to Get Your Hospital Accredited to Provide CME for Credit

Currently there are 17 hospitals and specialty societies that are now accredited by ASMA to designate Category 1 CME. Many on-going conferences and grand rounds at the hospitals and specialty societies are designated as Category 1. More hospitals will probably want to provide this service to their medical staffs. For information on becoming an accredited provider of CME, please contact Sandy Allyson at ASMA. An application will be sent, followed by a site survey of the facility.

Accredited Hospitals and Specialty Societies

American Academy of Pediatrics, Alaska Chapter
Alaska Native Medical Center
Alaska Thoracic Society/American Lung Association of Alaska
Anchorage Orthopedic Society
Columbia Alaska Regional Hospital
Charter North Behavioral Health System
Fairbanks Memorial Hospital
Friends for CMEs for Alaska
Juneau Medical Society
Ketchikan General Hospital
NORCAL Mutual Insurance Co.
Providence Alaska Medical Center
Providence Kodiak Island Hospital
Sitka Community Hospital
South Peninsula Hospital
Southern Region Emergency Medical Services
Valley Hospital

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American Medical Accreditation Program: AMA Trustee, Dr. Timothy Flaherty, Discusses the Road Ahead

What was your reaction to the debate over AMAP at the AMA's Interim Meeting?

We had an interesting discussion. The American Medical Accreditation Program, "AMAP," is extremely important to physicians. I think there had been a communications deficit, as there always is when people are getting started with a new program. Sometimes all the information people are requesting is not available. The specialty societies, in particular, had reservations and hesitations about the program, but came away convinced that AMAP was something we should move forward with on a fast track. I am pleased that support for AMAP is gaining momentum.

AMAP is a massive undertaking. Why is it necessary to move ahead so quickly?

The timing is critical. If we don't get it done now, we will lose out to the health plans, commercial vendors and other groups who are waiting in the wings to take over. If we are going to have a national acquisition of data about physicians and physician performance, it should be done by physicians; not the government, not the insurance companies. The AMA and the Federation are the best professional organizations to take on the job. With the Federation's help, we are confident we can succeed, and keep standards for physician performance in the hands of physicians.

How were members of AMAP's Governing Body selected?

We sought from the start to fill the seats on AMAP's Governing Body with experts who represent the different viewpoints and experiences that AMAP will need to succeed. We solicited nominations from all state, county and specialty societies, and have filled the seats with individuals representing hospitals, managed care, accrediting organizations, voluntary health care organizations, employers, and consumers, as well as state, county and specialty societies. In addition, four at-large physician seats were added to ensure the broadest representation possible.

How will the Federation partner with the AMA on AMAP?

AMAP is a Federation program. Thus, the Federation will play a critical role

throughout AMAP's design, implementation and operation. In fact, AMAP could not proceed without the Federation's expertise, participation, and support. For example, many state and county societies already play a vital role in credentialing and office site reviews. AMAP hopes to incorporate these existing programs and extend them to the national level so that the profession won't continue to be hassled by repetitive inspections when a single inspection will do. AMAP will result in less disruption of physicians' offices, medical records, and patient programs. It's a big plus.



Timothy T. Flaherty, MD

When will AMAP be up and running?

AMAP will be rolled out on a state-by-state basis. Massachusetts was selected as the initial implementation site because the Massachusetts Medical Society already has the necessary structural framework in place. A number of other states have volunteered to partner with AMAP in implementation of AMAP, and future states will be selected based on how far along each state is in terms of providing similar services to its members. Ultimately, AMAP will follow a natural progression adding more states and additional components as soon as feasible. We expect AMAP to be fully operational nationwide in four years.

What role will specialty board certification play in AMAP?

AMAP is a physician accreditation program. It is not a specialty board certification program. Obviously, if you are board-certified or recertified by your board, these factors will be included in your AMAP profile and should be. However, AMAP and

board certification are separate programs serving separate goals. AMAP will be working very closely with the American Board of Medical Specialties and other certifying agencies so that board certification will be appropriately weighed in the AMAP accreditation decision. And, we believe the specialties have a lot to gain through participation in AMAP. They will have the opportunity to set the standards for their specialty instead of having them imposed by outside groups.

Are you confident that the House of Medicine will unite behind AMAP?

I believe medicine will unite behind AMAP—at least as much as the profession can unite behind any program of this scope and complexity. However, the commitment to the overall program is what's important. And, it will be AMAP's commitment to use Federation resources and actively involve the specialty societies which will make the acceptance of AMAP more meaningful.

You have been active in meeting with employer coalitions across the country. How has AMAP been received by them?

I serve as an advisor to the National Business Coalition on Health, and I have also been meeting with benefit managers. They could not be more enthusiastic. Benefit managers have been looking for a reliable way to identify quality. AMAP will be a big plus for them because it will provide a "Good Housekeeping Seal of Approval" that they can take to their employees and say "See, this physician, or this group of physicians, has met the highest standards of quality as established by a group of their peers."

So you believe that patients, as well as physicians, will benefit from AMAP?

Absolutely. Anytime the medical profession can establish a single, universally-recognized standard of quality, physicians everywhere will strive to meet that standard. AMAP will result in an improved evaluation process for physicians, less hassle for physicians, and improved quality of care.

Interview by Wendy Sue Morphey, J.D.

Letter to the Editor . . .

NOTES/REFLECTIONS BASED ON PERSONAL EXPERIENCE

Abstract - [from *Physician Assistant Training for Native Alaskan Community Health Aides: The MEDEX Northwest Experience* - *Alaska Medicine*, Vol 36, Number 4, Oct/Dec 1994, pages 183-188]

Background - From 1980 through 1990, 16 Native Alaskan Community Health Aides and 21 non-Native Alaskans began physician assistant training at MEDEX Northwest at the University of Washington. This study was done to assess the outcome of training Native Alaskan health workers as physician assistants specifically whether Native Alaskan graduates are working in settings that serve Alaska Natives.

Methods - The backgrounds, educational experiences and deployment locations of Native and non-native Alaskans accepted for training were compared using MEDEX Northwest student records. The 1991 graduate survey was used to compare differences in practice settings, specialty and salary between Native and non-Native graduates working in Alaska in 1991.

Results - All of the non-Natives and 81% of the Natives completed the program. Of those completing the program, 100% of the Natives returned to Alaska where 91% found work as primary care physician assistants in clinics serving predominantly Native communities. By comparison 78% of the non-Native graduates returned to Alaska to work as physician assistants, 60% of them in primary care and

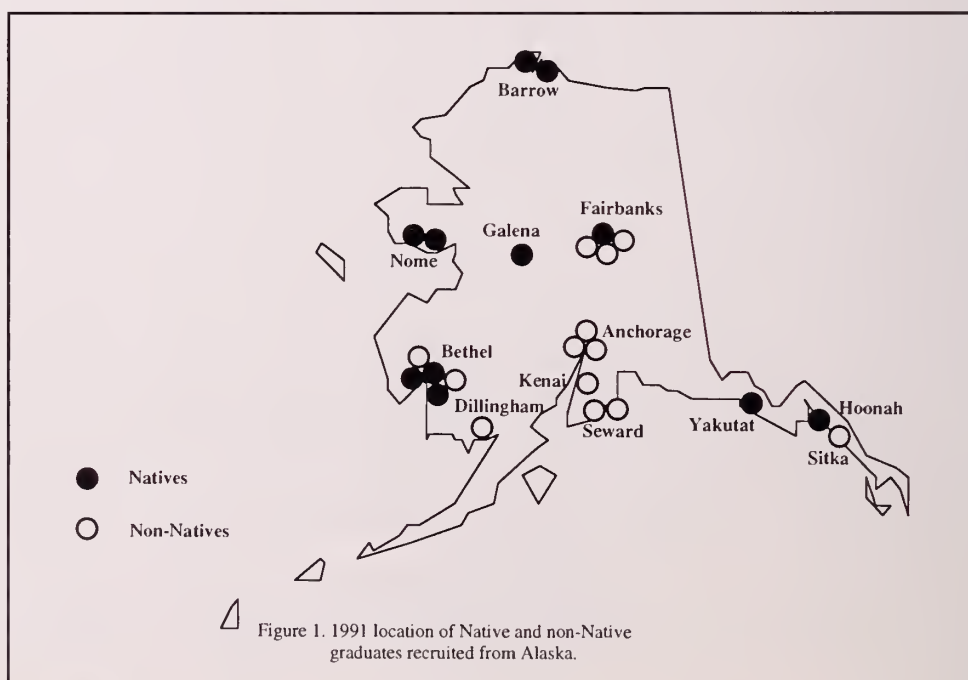
15% of them in predominantly Native communities. There were no significant differences in salary or benefits between Native and non-Native graduates.

Conclusions - Physician assistant training for entry level health workers is a viable strategy for increasing the number of under-represented minorities in the health professions. The Native graduates of MEDEX Northwest are returning to communities where they serve Native people both as health care providers and as professional role models.

Dear Editor:

From personal and professional experiences, may I add faces and the stories of four of the "black dots" representing the eleven PA-C Natives who are products of the "MEDEX Northwest Experience."

In 1991 eleven black dots on a chart represented the Alaska Natives who are Physician Assistant graduates of the MEDEX Program - the study concluded that these graduates, Native Alaskans, "serve Native people both as health care providers and as



professional role models” - (1) the study fails to examine the barriers to their progress, and (2) the sacrifices made to serve their own. Perhaps if personalities had been assigned to the “black dots” and their stories known, others could have and would have followed because the hardships, especially the need-less ones, could have been eliminated. Perhaps in the next decade, there would have been sufficient numbers of Native Alaskans prepared to serve their own or to at least constitute a valid survey.

In the process of assigning faces to the dots, these remarks are made considering statistics to be numbers with the tears removed, and no harm is meant toward anyone. These reflections are my own based on first hand knowledge.

“Faye” is an Inupiat and a Physician’s Assistant -Certified. Prior to making the flight to the village clinic where Faye worked, the warning was given that I might not be well recieved by the village’s number one provider. To the contrary, upon my arrival the PA was seated at the desk in the clinic, having a daily devotional prior to the beginning of the business of the day. Later I was given a paper, unpublished, that Faye had written in hopes of improving communication between “outside” providers and her people. Others had put her efforts aside but she tried once more - **Persistence** I came to learn was this lady’s suit. I read the paper and we have ‘read papers’ for one another now into our second decade since that first meeting. I learned that Faye and her husband and child went to Washington so Faye, a Community Health Aide, could attend the MEDEX program to be a Physician Assistant and return to Alaska to serve her people. Return she did.

Her PA-C career has been rocky; her personal and professional worlds filled at times with rejection by those whom she would serve and conflict after conflict erupted with would-be peers. The sacrifices made by Faye and her family to earn this PA-C went unnoticed yet the scars and pain remain. While in the MEDEX program, there was not enough money to feed the family, of course they had gone with Faye from the village to the school outside Alaska - the family would not have considered that it would be any other way. Those administering the program had not considered it from the Native family’s perspective at all - so the stipend for one did not stretch to feed three. Faye recalls how it feels to stand in the welfare line waiting for the handout of food. She recalls the

surprise when a card enclosing a ten dollar bill came from her namesake grandmother and how much love and encouragement came too.

While studying in the MEDEX program out of state the family’s house in the village in Alaska burned to the ground. Faye’s husband suffered a stroke and another daughter was born. Out of necessity and love, the baby was given to Faye’s sister. In theory and practicum, culture and practices clashed - Faye was persistent. She and her family returned to their village. There was difficulty locating an MD mentor or proctor. Health providers, non-natives, who were busy securing their positions of authority in a system brought from “outside” viewed a Native PA as a definite threat to their power base. Faye began exerting more energy battling those within the system who would hold her back. Each action as a PA had to be defended. Faye became aware of a letter from her non-Native supervisor to the mentor MD asking that Faye be blackballed and prevented from obtaining her license. With the stress of confronting her ambitious boss, (confrontation is to be avoided in Inupiat culture but is relished by some in other cultures) Faye began to bleed, was hospitalized after the confrontation, and almost lost the baby she was carrying. Later Faye, with this infant asleep on her back packed in her parka, was to testify before the U.S. Senate Select Committee on Indian Affairs, chaired by the Honorable Daniel K. Inouye. It was one of the most moving testimonies he had ever heard. This inspired Faye to learn to utilize the political system as a vehicle of change. Faye’s issues on the battleground grew and patient contact shrank. When Faye had returned from the MEDEX program, she and several of her sisters involved in health service, anticipated Faye would be acknowledge at the Community Health Aides’ Banquet. She was pointedly ignored. The eldest sister said to Faye, “I promise you, you will have your turn - someday we will be in charge ourselves.” This writer heard that promise made — yet the power, pride and battles have overshadowed the needs and accomplishments. The eldest sister later became “boss” — jealousy and sibling rivalry persisted and the PA-C sister, with a vision and direction of health service delivery based on her education and experience, was fired. She had been moved to a management position and admittedly had not a clue about management nor supervision in a system that operated contrary to her own community - lifestyle system. Frustrated, angry, hurt, and mov-

ing farther away from hands-on practice, Faye eventually submarined herself. Rejected, ostracized, she carelessly let her license lapse. Only recently, still on unemployment, has Faye reprioritized and retested to be re-instated. She plans now to work directly with her people via another agency. "I will do what I went to school to learn to do." Briefly, that's the face one dot represents.

Another would-be "dot" dropped out of the program to enter a drug and alcohol treatment center - later she completed the MEDEX program but continues unable to pass the exam for licensure.

The third "dot," another Native MEDEX PA-C works in an urban setting. It seems developing a professional relationship with peers is problematic. The differences arise in perceptions — the perception that one is totally right or wrong according to one's ethnic background. Trust is difficult to establish and if there is disagreement, it is taken personally. It is still a them vs. us mentality no matter how well educated. A chip on one's shoulder gets knocked off and complaints are written. A PA-C says she is insulted because the nursing staff does not accept her —she's not sure if it is because she is a native or a Native PA-C. Hopefully she was wearing a name tag that was visible.

The fourth "dot" represents a Native wife and mother who returned to her village to serve her people as a PA-C. With the strain of overwhelming needs from the community and a growing family, eventually she too resigned and let her PA-C license lapse. She served her people well, but the demands just never ended. The need for peer support and understanding was expressed, but she became overworked and little, if any, relief could be provided. All the signs of burnout were approaching too fast without intervention. There was no respite. It was a constant effort on her part to redirect the flow of the ocean with a teaspoon. Even her own Personnel Department never fully understood her role or that of a PA-C, so pay did not match the job. But if a blank check had been provided for her to fill in, that would not have held on to her and the services needed. It was certainly not a lack of "professionalism" either. Any "professional" would have been proud to include her as a colleague. But the isolation of "knowing," knowing what needed to be done and that there was only one

there who had been educated to do what was needed at that level just became too much — with whom was she to "debrief"? Of her own, who gave compliments more than criticism? As a lone provider at the advanced level, she represented to many all that was wrong with a sick system, yet she continued to respond, day and night, from one crisis to another, from one need to the next, no matter how simple or how complex. There was no time nor energy for "prevention" when daily maintenance was a struggle. She was a good provider, a role model and a true professional. She was exactly the right candidate for the MEDEX program. Hopefully, one day she will again retest and renew her practice.

Almost two decades later, who has benefitted to what degree from a program that many of us have gone to bat for over the years? MEDEX Northwest should probably meet its demise at last - A PA program is needed in Alaska and if there ever is one in place, perhaps a kinder hand can reach across the bridge and make the workload just a little lighter for everyone.

The focus now should be on the rapid coming about of the Certified Nurse Aides/Home Health Aides. No need to wait until time to study this issue in retrospect!

Mary Frances Hoyle, RN, MPH
Nightingale Neighbors
Nurse Aide/Home Health Aide Training
PO Box 875261
Wasilla, Alaska 99687
(907) 352-3670

[Mary Frances Hoyle is owner and instructor of Nightingale Neighbors. She teaches classes leading to certification as Nurse Aides/Home Health Aides, specializes in consultations, health services and health education.]

Meeting Notice

April 29 - May 2, 1998: International Conference on Physician Health sponsored by the American Medical Association and the Canadian Medical Association, Victoria, British Columbia, Canada. Abstract and registration information contact: E. Tejcek, Project Manager, 312-464-5073 (tel), elaine_tejcek@ama-assn.org (e-mail), 312-464-5841 (fax).

Glimpses of Alaskan Medical History

Edited by Robert Fortune, M.D.

Pipe-smoking along the Yukon (1867)

William Healy Dall came to Alaska in 1865, like Adams, as a 20-year-old working for the Overland Telegraph Expedition. He was employed as a naturalist, specializing in invertebrates and fishes, although he had a broad-ranging interest in all aspects of the natural world. Upon the unexpected death at Nulato of Robert Kennicott, Chief of the Scientific Corps, in May 1866, Dall assumed responsibility for the scientific aspects of the expedition. He remained on after the telegraph project's demise, and the following year ascended the Yukon all the way to Fort Yukon, exploring and mapping the great river. Upon leaving the territory in August 1868, with Alaska now United States property, Dall became associated with the Smithsonian Institution in Washington, where he wrote a detailed and widely read account of his years in Alaska. For the remainder of his life, Dall became the resident scientific guru on Alaskan affairs in Washington, frequently testifying before Congress and serving as a consultant.

The passage quoted below is taken from Dall's account of his labored journey up the Yukon in May 1867. The Indians are Koyukon and the place just above the confluence of the Koyukuk River. The Circassian tobacco mentioned came from the Caucasus Mountain region of Russia and was exceedingly strong, according to contemporary witnesses. According to Dall, the Americans used "long natural Kentucky leaf" tobacco, which they obtained from the Hudson's Bay Company.

"Two Indians in the bow of the boat would row until tired, and then we would stop for a few minutes to rest, and let them smoke. The last operation takes less than a minute: their pipes are so constructed as to hold but a very small pinch of tobacco. The bowl, with ears for tying it to the stem, is generally cast out of lead. Sometimes it is made of soft stone, bone, or even hard wood. The stem is made of two pieces of wood, hollowed on one side, and bound to the bowl and to each other by a narrow strip of deerskin.

"In smoking, the economical Indian generally cuts up a little birch wood, or the inner bark of the poplar, and mixes it with his tobacco. A few reindeer hairs, pulled from his parka, are rolled into a little ball, and placed in the bottom of the bowl to prevent the contents from being drawn into the stem. A pinch of tobacco, cut as fine as snuff, is inserted, and two or three whiffs are afforded by it. The smoke is inhaled into the lungs, producing a momentary stupefaction, and the operation is over. A fungus which grows on decayed birth trees, or tinder manufactured from the down of the poplar rubbed up with charcoal, is used with flint and steel for obtaining a light. Matches are highly valued, and readily purchased. The effect of the Circassian tobacco on the lungs is extremely bad, and among those tribes who use it, many die from asthma and congestion of the lungs. This is principally due to the saltpetre with which it is impregnated. The Indian pipe is copied from the Eskimo, as the latter were the first to obtain and use tobacco. . . . The Kutchin and Eastern Tinnah use one modelled after the clay pipes of the Hudson Bay Company, but they also carve very pretty ones out of birch knots and the root of the wild rose-bush.

". . . The Kutchin make pretty pipe-stems out of goose-quills wound around with colored porcupine quills. It is the custom in the English forts [of the Hudson's Bay Company] to make every Indian who comes to trade, a present of a clay pipe filled with tobacco. We were provided with cheap brown ones, with wooden stems, which were much liked by the natives. . . ."

REFERENCES

1. Dall, William Healy. *Alaska and its resources*. Boston: Lee and Shepherd, 1870. Pp. 78, 80-82
2. Sherwood, Morgan B. *Exploration of Alaska 1865-1900*. New Haven and London: Yale University Press, 1965. Pp. 15-35

From Out of the Past — Thirty Years Ago. . .

Historical Mileposts of 1967



Mr. Gerald Egelston, manager of education services for Lederle Laboratories, who has assisted with each of the ten symposiums conducted in Anchorage. For his work, Mr. Egelston was recently awarded honorary membership in the Anchorage Medical Society, first non-physician so honored. *From Alaska Medicine 1967*



Arndt von Hippel, MD
Became Editor-in-Chief of *Alaska Medicine*, 1967

Following are 1967 physician and medical faculty rosters and locations as well as 1967 populations and projections to the year 2000.

ANCHORAGE 99501, 99503, 99504

Archer, Gary W.	General Practice	Dittrich, J. Paul	Orthopedic Surgery
Beck, Phillip C.	Pathology	Drake, Duane L.	Radiology
Beirne, Michael F.	Pathology	Dunn, Wallace	Ears, Nose, Throat
Billings, Robert P.	General Practice	Dunn, Yurn O.	Dermatology
Blankinship, Gilbert P.	Internal Medicine	Ekvall, Leslie D., Jr.	Obstetrics-Gynecology
Cates, Vernon A.	General Practice	Fish, Winthrop	Internal Medicine
Chalmers, Alistair C.	Urology	Fitzpatrick, James J.	Internal Medicine
Chao, Chi-Mei Hwang	Anesthesiology	Fraser, James A.	Anesthesiology
Chenoweth, Charles E.	Eyes, Ears, Nose, Throat	Fritz, Milo H.	Eyes, Ears, Nose, Throat
Chernell, Eugene	Psychiatry	Hale, George E.	General Surgery
Crawford, Glenn B.	General Practice	Harrell, Roosevelt E.	General Practice
DePalatis, Sam	General Surgery	Hein, Michael F.	General Surgery
Dietz, David	General Surgery	Hillman, Frederick J.	General Surgery

1967

DIRECTORY OF ALASKA'S PHYSICIANS



Homay, Alan	General Practice	O'Malley, James E.	General Practice
Hood, Frederick R. Jr.	Thoracic Surgery	Ormond, Louise	Internal Medicine
Hunter, Betty	Pediatrics	Pennington, John A.	Anesthesiology
Ivy, William H.	General Practice	Phillips, Francis J.	Thoracic Surgery
Jackson, Marcell	General Practice	Pretz, Ernest	General Practice
James, Herbert	General Surgery	Rader, William J.	Psychiatry
Jansen, Grace T.	Anesthesiology	Renn, A. Claire	Obstetrics-Gynecology
Johnson, Calvin T.	General Practice	Rogers, Donald R.	Pathology
Jones, Warren R.	General Practice	Romig, Howard G.	Obstetrics-Gynecology
Kiester, Thomas E.	Orthopedic Surgery	Sedwick, Jack O.	General Surgery
Koeniger, Peter J.	Obstetrics-Gynecology	Shelton, Joseph H.	Ophthalmology
Kraft, Edwin C.	General Surgery	Shoff, Mahlon J.	Eye, Ear, Nose, Throat
Langdon, J. Ray	Psychiatry	Shohl, Rosalie L.	Anesthesiology
Leong, Rudy J.	General Practice	Shohl, Theodore	General Surgery
Maddock, William O.	Internal Medicine	Starr, Merritt P.	Internal Medicine
Manwiller, Charles E., Jr.	General Practice	St. John, Charles F.	General Practice
Martin, Asa L.	General Practice	Strauss, Fred T.	Pathology
Maxwell, Elden I. Jr.	General Practice	Sydnam, Nancy E.	General Practice
Mead, Perry A.	Neurosurgery	Tower, John C.	Pediatrics
Mills, William J., Jr.	Orthopedic Surgery	Voke, Edward M.	Orthopedic Surgery
(Out of state-Back in 1968)		von Hippel, Arndt	Thoracic Surgery
Morgan, Royce H.	General Practice	von Hippel, Marianne W.	Pediatrics
Nicholas, C. F.	General Practice	Walkowski, August S.	General Practice

Whaley, Helen	Pediatric Neurology	HOMER 99603	
Whaley, Robert	Internal Medicine		
Wichman, George B.	Orthopedic Surgery	Leih, George G. T.	General Practice
Wieland, Tryon S.	General Practice		
Wilkins, Robert B.	Internal Medicine	JUNEAU 99801	
Wilson, J. Rodman, Jr.	Internal Medicine	Akiyama, Henry I.	Internal Medicine
Wright, Bruce C.	Radiology	Chapman, Jean A.	General Practice
Wright, Virginia L.	Psychiatry	Dalton, John J.	General Practice
Zartman, Harvey F.	Pediatrics	Leer, R. Harrison	Ophthalmology
		Ray, E. Stanley	General Practice
CORDOVA 99574		Riederer, Joseph D.	General Practice
Sacry, Gayle	General Practice	Rude, Joseph O.	Retired, General Practice
		Smalley, Robert R.	General Surgery
DILLINGHAM 99576			
Libby, John E.	General Practice	KENAI 99611	
		Armstrong, O. H.	General Practice
FAIRBANKS 99701			
Bugh, C. William	General Practice	KETCHIKAN 99901	
Deely, Nicholas F.	Pediatrics	Carr, Ralph W.	General Practice
Dunlap, Lawrence I.	Obstetrics - Gynecology	Henrickson, Hilbert	General Practice
Earp, Ancel, Jr.	General Surgery	Mortensen, James W.	General Practice
Evans, Raymond D.	General Practice	Salazar, Louis A.	General Practice
Haggland, Paul B.	Orthopedic Surgery	Smith, Phyllis E.	General Practice
Hanns, Waldo H.	Orthopedic Surgery	Wilson, Arthur N.	General Practice
James, William H.	Pediatrics	Wilson, Arthur N., Jr.	Internal Medicine
Johnson, Joseph K., II	General Surgery	Wilson, James A.	General Surgery
Kinn, William F.	Ophthalmology		
Kowalski, Martha G.	General Practice	KODIAK 99615	
Lindig, Edwin Jr.	Orthopedic Surgery	Eufemio, John J.	General Surgery
Lundquist, James A.	General Practice	Johnson, R. Holmes	General Practice
Marrow, Charles T.	Internal Medicine	McMurty, Mildred	Pediatrics
Noyes, John L.	General Practice		
Petajan, Jack H.	Neurology	NOME 99762	
Ribar, Joseph M.	General Practice	Bartko, Harold	General Surgery
Roth, Robert A.	General Practice		
Schaible, Arthur J.	General Surgery	PALMER 99645	
Storrs, Henry G.	General Surgery	Browning, Levi M.	Admin and General Practice
Straatsma, G.	Internal Medicine	Cunningham, Walter D.	General Practice
Walkup, Gary	Internal Medicine	Hume, Vincent	General Practice
Weston, John L.	General Practice		
Worrall, Joseph A.	Obstetrics-Gynecology	PETERSBURG 99833	
		Coon, Duane A.	General Practice
GLENNALLEN 99588		Smith, Russell C.	General Practice
Pinneo, James S.	General Surgery (Back in '68)		
Schneider, Chester L.	General Practice	SEWARD 99664	
		Gentles, Ernest W.	General Practice
HAINES 99827		Watson, E. A.	General Surgeon
Jones, Stanley	General Practice		

SITKA 99835

Longenbaugh, George H.	General Surgery
Moore, Philip H.	Orthopedic Surgery
Phillips, Theodore J.	General Practice
Shuler, Robert H.	General Practice
Spencer, Edward D.	General Practice

SOLDOTNA 99669

Gaede, Elmer E.	General Practice
-----------------	------------------

Hansen, Peter O.
Isaak, Paul G.

General Practice
General Practice

VALDEZ 99686

Carr, John E.

General Practice

WRANGELL 99929

Dale, David W.

General Practice

**PHYSICIANS AT THE U.S.P.H.S. HOSPITALS
PHS ALASKA NATIVE HOSPITALS**

ANCHORAGE**Alaska Native Medical Center 99501**

Wheritt, Holman R., Area Director
 Bland, Wiley, M.D.
 Brenneman, George, M.D.
 Brown, Carolyn V., M.D.
 Brown, George W., M.D.
 Brown, Kenneth, M.D.
 Brownsberger, Keith M., M.D.
 Chao, Richard, M.D.
 Dippe, D. W., M.D.
 Dolese, David B., M.D.
 Dugan, Philip, M.D.
 Fleshman, Kenneth, M.D.
 Goorman, Jean, M.D.
 Hirschfeld, James, M.D.
 Jatlow, Peter, M.D.
 Johnson, M. Walter, M.D.
 Kottra, John J., M.D.
 Kottra, Lorraine, M.D.
 Lanier, Anne, M.D.
 Lanier, James, M.D.

Lucas, James R., M.D.
 Martin, C. Edwin, M.D.
 Mikkelsen, Michael, M.D.
 Momberger, Glenn, M.D.
 Nielson, Charles, M.D.
 Park, Gloria, M.D.
 Peters, George N., M.D.
 Seuffert, George W., M.D.
 Silber, Sherman J., M.D.
 Spence, David, M.D.
 Trahos, E. M., M.D.
 Tschopp, Charles F., M.D.
 Williams, Eugene D., M.D.
 Wilson, J. F., M.D.
 Wilson, Martha R., M.D.
 Yeakley, Robert A., M.D.

Following are Residents (1 yr.)

Eilers, Anton, M.D.
 Johnson, Kit, M.D.
 Lewis, Amos, M.D.

Bloom, Joseph, M.D. (Chief of Mental
 Health for Area and ANMC)
 Foster, Ashley, Ph D.

ANNETTE ISLAND**PHS Alaska Native Health Center 99920**

Richard Bonaldi, M.D., Health Clinic Director

BARROW**PHS Alaska Native Hospital
99723**

David L. Perkins, M.D., Service Unit Director
Jerry L. Coles, M.D.

BETHEL**PHS Alaska Native Hospital
99559**

Robert Shaw, M.D., Service Unit Director
George L. Stewart, M.D.
David M. Leaman, M.D.
Paul L. Eneboe, M.D.
James K. Bauman, M.D.
Lee Schmidt, M.D.

JUNEAU

PHS Alaska Native Health Center
99801

Jerry Rankin, M.D., Health Clinic Director
Stanley F. Sliwinski, M.D.

KANAKANAK

PHS Alaska Native Hospital
99567

Daniel J. O'Connell, M.D., Service Unit Director
R. L. Lorenzo, M.D.
Jordan Holloway, M.D.

KETCHIKAN

PHS Alaska Native Health Center
99901

Stanley Yoder, M.D., Health Clinic Director
Ronald E. Tinsley, M.D.

KOTZEBUE

PHS Alaska Native Hospital
99752

Richard T. Light, M.D., Service Unit Director
L. G. Dillon, M.D.
Harry L. Owens, M.D.

MT. EDGE CUMBE

PHS Alaska Native Hospital
99835

George N. Wagnon, M.D., Medical Director
Daniel Failoni, M.D.
J. B. Deck, M.D.
Edson F. Deal, M.D.
John R. Herd, M.D.
Peter E. Cannava, M.D.
Charles D. Coln, M.D.
Robert R. Thompson, M.D.
Mary J. Brand, M.D.

ST. GEORGE ISLAND (PRIBILOF ISLANDS)

PHS Alaska Native Hospital
99660

Holm Neumann, M.D., Medical Officer in Charge

TANANA

PHS Alaska Native Hospital
99777

J. K. Jones, M.D., Service Unit Director
Charles C. Carr, M.D., Assistant Director

DEPARTMENT OF HEALTH AND WELFARE PHYSICIANS

ANCHORAGE

Tower, Elizabeth A.
Koutsy, Carl D.
Rollins, J. P.
Ahlem, Judith
Granat, Henry G.
Hooker, Keith R.
Johnstone, Bruce B.
O'Brien, Aloysius V.

Southcentral Regional Health Officer
Director, Alaska Psychiatric Institute
Chief, Psychiatric Services
Regional Mental Health Clinic
Alaska Psychiatric Institute
Tuberculosis Consultant
Alaska Psychiatric Institute
Alaska Psychiatric Institute

JUNEAU

Chapman, W. J.
Cavitt, Robert F.
Reddy, D. V.
Gorton, Virginia
Lesh, Jack K.

Commissioner
Director, Public Health
Director, Child Health
Mental Health
Welfare

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John E. Hepler, M.D.

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Anchorage, Alaska 99501

VETERANS ADMINISTRATION

Richard Kraft, M.D.
Grace Field, M.D. (Retired)

P.O. Box 1288
Box 813
Juneau, Alaska 99801

ANCHORAGE BOROUGH HEALTH CENTER

Duncan, David R. L., M.D.

Anchorage Borough Health Officer

NUMBER OF MILITARY PHYSICIANS BY SPECIALTY

United States Air Force

1. Headquarters, Alaskan Air Command, Elmendorf AFB, AK:
a. Administrative and Staff Medicine 2

2. USAF Hospital Elmendorf, Elmendorf AFB, Alaska:

- a. Administrative and Staff Medicine 1
- b. Aerospace Medicine 7
- c. General Practice 3
- d. Pediatrics 4
- e. Internal Medicine 4
- f. General Surgery 4
- g. Urology 2
- h. Ophthalmology 2
- i. Otolaryngology 2
- j. Orthopedic Surgery 3
- k. Obstetrics and Gynecology 4
- l. Cardiology 1
- m. Dermatology 1
- n. Allergy 1
- o. Neurology 1
- p. Psychiatry 4
- q. Pathology 1
- r. Radiology 2
- s. Anesthesiology 2

3. 5010 USAF Hospital, Eielson AFB, Alaska:

- a. Aerospace Medicine 4
- b. General Practice 2
- c. Pediatrics 1
- d. Internal Medicine 1
- e. General Surgery 1

4. 5079 USAF Dispensary, Shemya AFS, Alaska:

- a. Aerospace Medicine 1

5. 5074 USAF Dispensary, Wildwood AFS, Alaska:

- a. General Practice 2

United States Navy

1. Station Hospital, U. S. Naval Station, Kodiak, Alaska:
a. Aerospace Medicine

- b. General Practice
- c. Obstetrics and Gynecology
- d. General Surgery
- e. Internal Medicine

2. Station Hospital, U.S. Naval Station, Adak, Alaska:

- a. Aerospace Medicine
- b. General Practice
- c. Obstetrics and Gynecology
- d. General Surgery

United States Army

1. Headquarters, U.S. Army Alaska, Ft Richardson, AK:

- a. Administrative and Staff Medicine 1
- b. Preventive Medicine 1

2. Bassett Army Hospital, Fort Wainwright, AK:

- a. Administrative and Staff Medicine 1
- b. Aerospace Medicine 1
- c. General Practice 8
- d. Pediatrics 2
- e. Internal Medicine 2
- f. General Surgery 2
- g. Orthopedic Surgery 1
- h. Ophthalmology 1
- i. Obstetrics and Gynecology 3
- j. Radiology 1
- k. Psychiatry 1
- l. Pathology 1

3. Dispensary, Fort Richardson, Alaska:

- a. Aerospace Medicine 1
- b. General Practice 8
- c. Internal Medicine 2
- d. Pediatrics 1
- e. Psychiatry 1

4. Dispensary, Fort Greely, Alaska:

- a. General Practice 2

ARCTIC HEALTH RESEARCH LABORATORY — FAIRBANKS

Maynard, James E., M.D.
Boyd, David L., M.D.
Noble, Gary R., M.D.
Lyons, Richard, M.D.

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ANCHORAGE—Alaska Native Medical Center, Box 7-741

FAIRBANKS—Northward Drug, Box 1207

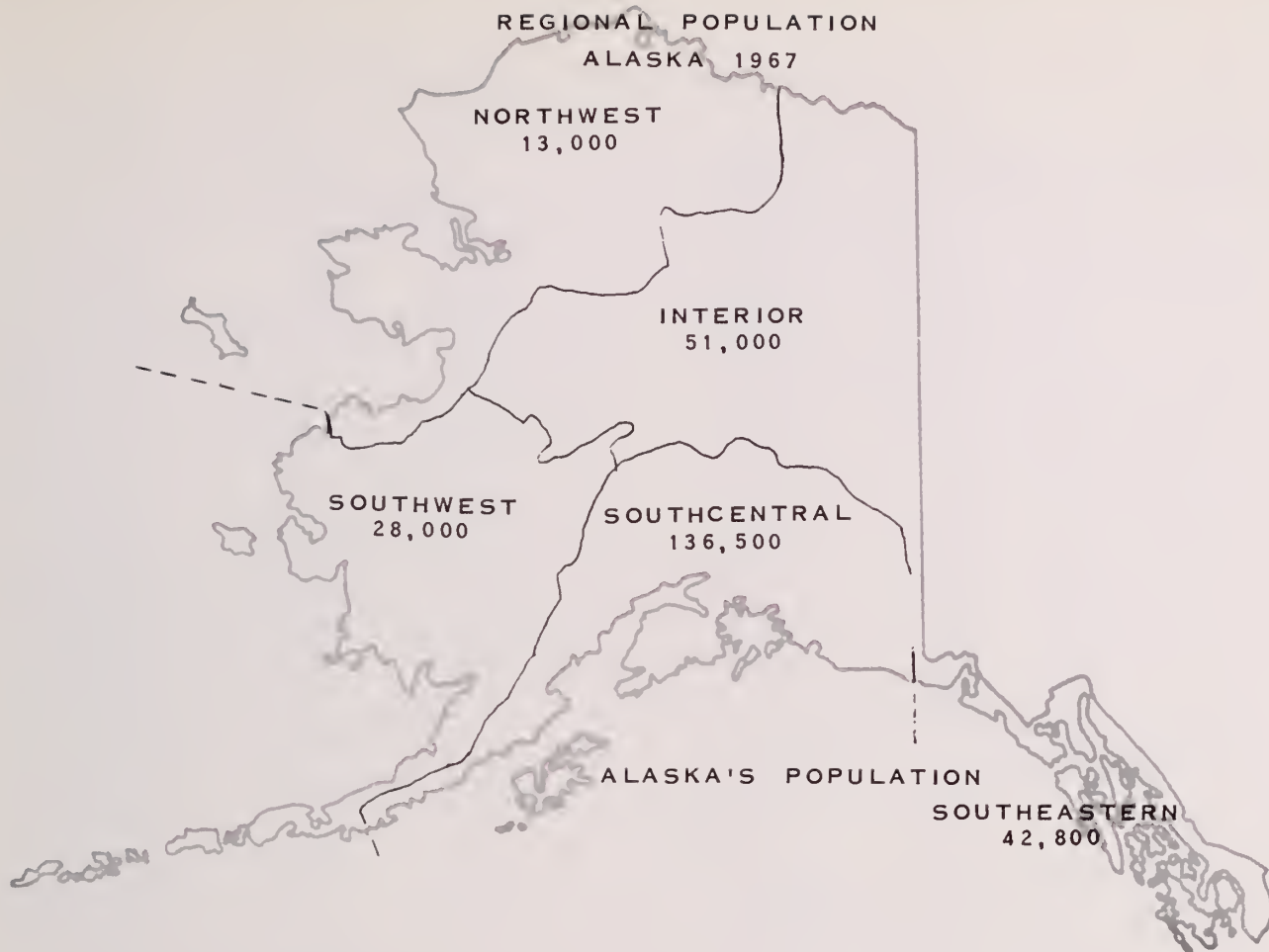
JUNEAU—St. Ann's Hospital, 419 6th Street, Information Center Only

KETCHIKAN—Ketchikan General Hospital, 347 Bowden Street

MT. EDGE CUMBE—Alaska Native Hospital, Public Health Service

ALASKA'S HOSPITALS & NURSING HOMES IN 1967

1. ADAK (Population 2,613)
 - a. U.S. Naval Station Hospital - 26 beds
2. ANCHORAGE (Population 106,800)
 - a. PHS Alaska Native Health Hospital, Box 7-741 - 340 beds
 - b. Alaska Psychiatric Institute, 2900 Providence Avenue - 225 beds
 - c. Anchorage Community Hospital, 825 L Street - 45 beds
 - d. Providence Hospital 3200 Benedict Drive - 121 beds
 - e. Ridgeview Manor Nursing Home, Box 3-3871 - 18 beds
 - f. Woodhaven Rest Home, 309 Fireweed Lane - 23 beds
 - g. U.S.A.F. 5005th Hospital, Elmendorf Air Force Base - 200 beds
3. BARROW (Population 2,600)
 - a. PHS Alaska Native Health Hospital - 12 beds
4. BEHTEL (Population 7,000)
 - a. PHS Alaska Native Health Hospital - 65 beds
5. BIG DELTA (Population 155)
 - a. Fort Greely Dispensary - 2 beds
6. CORDOVA (Population 2,000)
 - a. Cordova Community Hospital - 22 beds
7. FAIRBANKS (Population 45,400)
 - a. St. Joseph's Hospital, Box 377 - 67 beds
 - b. Bassett Army Hospital, Fort Wainwright - 192 beds
 - c. Eielson Air Force Base Hospital - 20 beds
 - d. Fairbanks Pioneer Home - 63 beds
8. GLENNALLEN (Population 300)
 - a. Faith Hospital, Box 5 - 2 beds
9. HOMER (Population 1,250)
 - a. Homer Hospital, Box 683 - 6 beds
10. JUNEAU (Population 13,000)
 - a. St. Ann's Hospital, 419 6th Street - 60 beds
11. DILLINGHAM (Population 5,000)
 - a. PHS Alaska Native Health Hospital - 38 beds
12. KETCHIKAN (Population 13,800)
 - a. Ketchikan General Hospital, 3100 Tongass Avenue - 100 beds
13. KODIAK (Population 9,500)
 - a. Griffin Memorial Hospital, Box 1187 - 17 beds
 - b. U.S. Naval Hospital - 85 beds
 - c. New 25 bed Hospital in construction
14. KOTZEBUE (Population 1,774)
 - a. PHS Alaska Native Health Hospital - 54 beds
15. NOME (Population 6,700)
 - a. Maynard MacDougall Memorial Hospital, Box 50 - 28 beds
16. PALMER (Population 6,400)
 - a. Valley Presbyterian Hospital, Box H - 27 beds
17. PETERSBURG (Population 1,800)
 - a. Petersburg General Hospital - 21 beds
18. ST. GEORGE ISLAND (Population 250)
 - a. PHS St. George Island Hospital - 6 beds
19. ST. PAUL ISLAND (Population 433)
 - a. PHS St. Paul Island Hospital - 8 beds
20. SEWARD (Population 2,200)
 - a. Seward General Hospital, Box 365 - 33 beds
 - b. Wesleyan Hospital, Box 456 - 22 beds (nursing home)
21. SITKA (Population 8,200)
 - a. Alaska Pioneers Home, Box 198 - 279 beds
 - b. PHS Alaska Native Health Hosp, Mt Edgecumbe - 166 beds
 - c. Sitka Community Hospital, Box 500 - 25 beds
22. TANANA (Population 683)
 - a. PHS Alaska Native Health Hospital - 32 beds
23. VALDEZ (Population 2,400)
 - a. Valdez Memorial Hospital - 165 beds
 1. 150 Ambulatory Mentally Retarded
 2. 15 General Hospital beds
24. WRANGELL (Population 2,000)
 - a. Bishop Rowe General Hospital, Box 80 - 15 beds
25. SKAGWAY (Population 650)
 - a. The White Pass-Yukon Hospital - 12 beds



SOURCE: George W. Rogers, Ph.D., Research Professor of Economics Institute of Social Economics and Governmental Research, University of Alaska, College, Alaska 99701, from "Economic and Social Guidelines for the Washington-Alaska Regional Medical Program", July 24, 1967.

Total Population	-	272,000
Military	-	31,000
Civilian	-	241,000
Non-Native	-	190,300
Native	-	50,700

REGIONAL POPULATION - 1967

I. Southeastern	-	42,800			
Military	-	700			
Civilian	-	42,100	IV. Interior	-	51,100
Non-Native	-	32,200	Military	-	10,600
Native	-	50,700	Civilian	-	40,500
II. Southcentral	-	136,500	Non-Native	-	35,300
Military	-	17,200	Native	-	5,200
Civilian	-	119,300	V. Northwest	-	13,000
Non-Native	-	112,000	Military	-	700
Native	-	7,300	Civilian	-	12,300
III. Southwest	-	28,000	Non-Native	-	1,800
Military	-	4,100	Native	-	10,500
Civilian	-	23,900			
Non-Native	-	6,100			
Native	-	17,800			

PROJECTED REGIONAL POPULATION - 1970-2000

	Low Estimates	High Estimates		Low Estimates	High Estimates
Anticipated Total Population:			III. Anticipated Total Population:		
1970	293,000	332,500	1970	25,000	26,500
1975	311,000	406,000	1975	26,000	28,000
1980	329,000	491,000	1980	27,000	31,000
1985	349,000	562,000	1985	28,000	36,000
1990	369,000	649,000	1990	29,500	40,000
1995	390,000	808,000	1995	31,000	53,000
2000	411,000	928,000	2000	32,500	73,000
I. Anticipated Southeastern Population:IV.			Anticipated Interior Population:		
1970	44,500	55,000	1970	53,500	75,000
1975	47,000	81,000	1975	56,000	103,000
1980	49,000	112,000	1980	59,000	133,000
1985	51,500	127,000	1985	62,000	138,000
1990	54,500	152,000	1990	65,000	164,000
1995	57,000	213,000	1995	68,000	200,000
2000	60,000	246,000	2000	71,500	232,000
II. Anticipated Southcentral Population:			V. Anticipated Northwest Population:		
1970	156,500	157,000	1970	13,500	19,000
1975	168,000	170,000	1975	14,000	24,000
1980	179,000	184,000	1980	15,000	31,000
1985	191,500	219,000	1985	16,000	42,000
1990	203,000	242,000	1990	17,000	51,000
1995	216,000	275,000	1995	18,000	67,000
2000	228,000	295,000	2000	19,000	82,000

LOCATION OF ALASKA'S PACKAGED DISASTER HOSPITALS

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1. Two packaged disaster hospitals are stored at the Alaska Disaster Office Warehouse; Mr. Clyde Blocker, Custodian; Dr. David Duncan, Alternate Custodian.

Fairbanks

1. A packaged disaster hospital is stored at the University of Alaska; Mr. Leonard Lobban, Civil Defense Director, Custodian.
2. A packaged disaster hospital is stored at Fort Wainwright; Mr. Leonard Lobban, Civil Defense Director, Custodian; Dr. Raymond Evans and Mr. Al George, Alternate Custodian.

Homer

1. A packaged disaster hospital is stored at the Homer Electric warehouse; Mr. Howard Stone, City Manager, Custodian.

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1. A packaged disaster hospital is stored at the Fifth Street School, one block from St. Ann's Hospital; Mr. Art Walther, Civil Defense Director, Custodian.

Kenai

1. A packaged disaster hospital is stored at the Kenai City warehouse; Mr. Mack McGahan, Custodian.

Ketchikan

1. A packaged disaster hospital is stored at the old Ketchikan Hospital in downtown Ketchikan; Mr. Gordon Zerbetz, Custodian; Dr. J. H. Wilson, Alternate Custodian.

Seward

1. A packaged disaster hospital is stored at the Seward Civil Defense Warehouse; Mr. Kester Gotts, City Manager, Custodian.

(continued on next page)

Letter to the Editor. . .

MY UNCLE, A DOCTOR

Dear Editor

I chanced upon a brief essay which Dr. Rodman Wilson wrote for the fall edition of the *Alaska Medicine* Journal, "My Uncle, A Doctor." This provided me with a moment of quiet reflection.

There certainly was a time when the focus of medicine was more as a caring profession than the high pressure business which it seems to be all too often these days. Thank you for writing your article, reminding me of things which should, perhaps, be most important in the practice of medicine today, and which are all too easily forgotten in this age of equating patients with diagnostic codes.

Allan G. Schlicht, MD
Juneau, AK 99803



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(continued from page 46)

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6. ACC / AHA Practice Guidelines. Guidelines for the management of patients with acute myocardial infarction. *JACC*, 1996;28:(5):1328-428.

(continued from previous page)

Sitka

1. A packaged disaster hospital is stored at Sitka High School; Mr. Walter Dangel, Civil Defense Director, Custodian.

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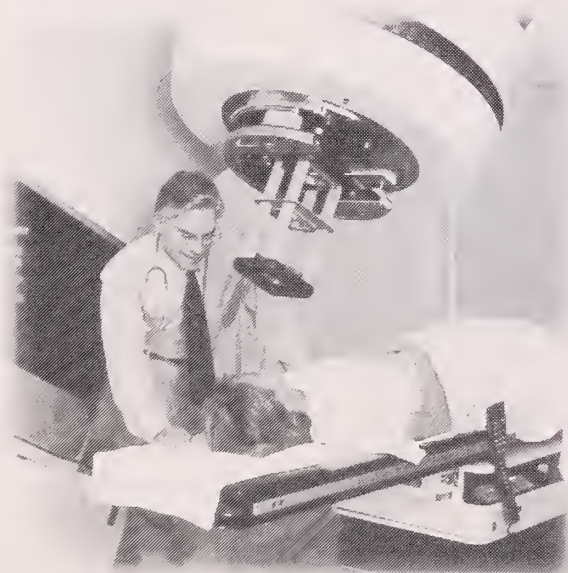
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Photo courtesy of Charles Allyson

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Mental Health Considerations with the Yupik Eskimo

James B. Jordan, Ph.D.⁽¹⁾

ABSTRACT

In cross-cultural mental health, there is a need to understand the culture from which a person belongs before psychotherapy can be effective. The Yupik (Siberian) Eskimos of the St. Lawrence Island area have several historical traumas that have effected their cultural group. This paper addresses some of the important factors that have formed personality features of the Yupik. Discussion centers on the mental health factors inherent in the cultural shift and historical traumas that have occurred from the 1800s to the present, including traditional livelihood, family role patterns, and education. This particular cultural shift is one of traditional independence to European dependence.

INTRODUCTION

Social upheaval, mental health, and the needed culture-specific psychotherapy have long been documented with lower 48 American Indian populations (1-3). However, there is far less literature written about the Alaska Native Eskimo. The purpose of this article is threefold: 1) to describe the historical trauma inherent in the psychological make-up of the Yupik; 2) to describe some of the resulting changes in the Yupik family values; and 3) to articulate needed culture-specific mental health interventions for this population.

THE CULTURAL AREA AND SOCIAL STRUCTURE

The Seward Peninsula in western Alaska is an area approximately 400 miles east to west and 250 miles north to south. The peninsula area and Norton Sound have approximately 30 villages and the town of Nome (pop, 4,500). Included in this cultural area is St. Lawrence Island which is 250 miles southwest of

Nome. St. Lawrence Island has two major villages, Savoonga and Gambell.

Yupik Eskimos in this region have been primarily coastal hunting people for thousands of years (4) with a dependence upon sea mammal products for their livelihood. The movements of this group were determined by the seasonal migrations of the sea mammals. The year was broken up by large communal hunting endeavors during the early summer for whale hunting season.

This part of the world is inhabited by two Eskimo groups. On the eastern side, including Norton Sound and the Seward Peninsula, it is traditionally inhabited by the Inuit (also Inupiat, Inupiaq) Eskimo. On the western side, including St. Lawrence Island (U.S.A.) and the Russian Chukchi Peninsula, it is inhabited by the Yupik, or Siberian Eskimo (also Yuit). There is little difference between the Yupik and Siberian Eskimo, with a relative homogeneity of the (Russian) Chukchi Peninsula, Siberian Eskimo and their immediate familial relations on St. Lawrence Island.

The social organization of the Yupik people was characterized by strong primary family relationships (affinal and consanguinal). The extended family was important for inter-dependent survival and seasonal community hunting. Relationships were strengthened by communal sharing, reciprocity and adoption. There were strong societal values for visiting and gift giving between individuals and groups. Adoption was also a very important social mechanism between individual families. This was because children were highly valued and adoption provided childless or older couples with a chance to raise children.

There was a marked lack of hierarchical social structure in Eskimo life. The leaders of the band were known as "umialik", meaning owner of the whale boat (umiak). The leader assumed his position by virtue of his personal characteristics, primarily hunting skills and as a provider for his family. The leader's values were based upon his capacity for generosity, wisdom, and community respect. Leadership was never inherited, as it is only effective at those times of the year when the community is large and in need of leadership.

(1) Norton Sound Community Mental Health, Nome, Alaska.

Reprint requests: American Indian Community Mental Health, PO Box 365, Greeley, Colorado, 80631

The Eskimo has had contact with the Anglo culture since the 1850s. The first and most important contribution of the Europeans to the native population was the firearm. However, with the introduction of the firearm there began an exploitation of the sea mammals in the region. The large number of Russian and American whalers taught the principles of large scale exploitation. A cultural value shift occurred for the Eskimo when he changed from his constant survival needs to an increase in trading of stockpiled sea mammals. With this imbalance of the natural order, exploitation led to reducing sea mammal populations to near extinction levels. Consequently, traditional independence changed to European dependence.

HISTORICAL TRAUMA

One of the most devastating historical traumas of the Yupik was the rapid spread of European contagious diseases. Epidemics of tuberculosis, influenza, and measles would result in a tremendous reduction in population. The Alaskan flu epidemic at the turn of the century devastated many communities. St. Lawrence and other island groups of Eskimos were particularly hard hit by this epidemic. The result was that large numbers of orphaned and surviving Eskimo children were sent to the mainland orphanages.

As a result of this historical trauma, a new acculturated group of Eskimos emerged. The Eskimos adapted a word, "NUNAMIUT", to describe this general cultural group of their people. The word is derived from NUNA meaning "land", and MIUT meaning "people of". These "people of the land" came under the influence of European religions who were sponsoring the different orphanages and schools.

FAMILY VALUES AND PERSONALITY CHARACTERISTICS

Mohatt, McDiarmid, and Montoya (5) summarize some of the changing trends in greater Alaska cultural family structure: toward single parent families headed by Native mothers; toward married families which are interracial; toward unmarried Native males; rural Alaska tends to have the largest households (27% have households of 6 or more); and rural families have a lower incidence of divorce (18%). These family trends characterize some of the Yupik experience, but there are particular qualities to be described.

The adaptation by the people to the harsh environment has evolved several personality characteristics. The survival-oriented and close-knit social structure has placed a high value system on: the communal,

extended family; ego-resiliency; environmental resourcefulness; and perseverance.

However, in modern times there have been changes to this hypothetical personality. As a result of acculturation and assimilation, the more acculturated Yupik lives in greater conflict with his/her sense of "Being". A unique conflict has emerged.

The personality characteristic of *Resilience* has changed to a range of behaviors — from steadfastness to passive resistance. There is a feeling that pervades many Yupik clients, when they first come in for psychotherapy. The idea of psychotherapy or counseling is still very new. Not able to articulate their own cultural personality characteristics, many clients passively resist attempts at change.

The value on *Resourcefulness* has remained intact with some natural elements, but not with modern disposable items. There has been a great deal of difficulty in adapting to disposal with modern plastics and nonbiodegradable material. The old solution of taking the year's trash out onto the frozen Bering Strait and letting it sink with the spring thaw - doesn't work. The Environmental Protection Agency is presently attempting to teach new disposal methods. However, with limited funding, they are restricted to sending an occasional Vista volunteer to help correct the situation. One Vista volunteer reported that, "It is an ecological nightmare in the villages with non-biodegradable trash accumulating such as styrofoam, plastic, glass, and aluminum (6).

The resourcefulness of these survival oriented people has changed. Many Yupik are at odds with this ethical dilemma; on one hand, traditional recycling has been based upon natural, biodegradable sea mammal products or wood, — on the other hand, these principles are compromised when there is introduced "permanent" man-made objects such as plastic. In addition, there is less need to be resourceful when the role-model of European inhabitants teach the new value of "disposable objects".

And finally the personality characteristic of *Perseverance* has been eroded. With the introduction of church sponsored orphanages and schools, there was a shift in the culture to accepting "outside" help and not needing to maintain "inner-system" integrity. The drive to persevere was cushioned with social agency support. This shift has also changed the thinking process from a problem-solving mode to one of denial and minimization ego defenses. Denial of the extent of the cultural problems and denial of the loss of personal freedom has resulted in a personality change. Minimization is another ego defense on the continuum of denial. By minimizing the acculturation problems, individuals can continue pretending that they are not effected.

MENTAL HEALTH CONSIDERATIONS

Mental health programs with Yupik Eskimos should represent cultural values and culture-specific interventions. The primary provider for the (American) Yupik population is Norton Sound Health Corporation in Nome. They have been contracted by the Bering Strait Native Corporation, representing the individual Yupik villages. The mental health program provides mental health services and in conjunction with the Village Health Services (also Norton Sound Health Corporation) they provide emergency psychiatric services.

However, their primary mental health intervention remains based on an individual "ego psychology" model. This is Freud's and his follower's versions of the individual "self". There is an emphasis placed on the individual Yupik person, struggling with his/her "self" and not to the Yupik's traditional *communal* identity. The notion of an individualized process of self underlies other related theoretical approaches such as cognitive-behavioral, Gestalt, and the Humanist school.

It is suggested that a more appropriate theoretical approach would be with the family/systems and group therapy models. The literature demonstrates these two models as being very effective within other Native groups who have similar cultural values placed on the extended family (7-11). Considering the past historical trauma, the extended-family unit is in need of reintegration.

In crisis situations, Yupik family values need to be taken into immediate consideration. The most common crisis and psychosocial stressor among the Yupik is family related (12). The author has found that individual therapeutic interventions are very in efficacy. The very changes worked on by the individual are often undone when the client returns to his/her primary support system — the family. It's the family system that needs to be a part of the healing and thereby taking care of the individual. Just as family therapy theory points out, the "identified patient" is the one who first comes into therapy — as the bearer of the family emotional trauma.

The Yupik family has been re-experiencing trauma over several generations. Families may be perceived as multi-generational emotional systems and as such, family history becomes central to intervention strategies (13). Harold Napoleon (14), a Yupik Eskimo from Southwest Alaska compares the Great Death in Alaska at the turn of the century to other major traumatic events such

as the Holocaust. He particularly describes the trauma of entire village populations as being decimated through infection and starvation. This historical trauma is a part of the group memory and therefore part of the personality structure of the Yupik people.

Another mental health consideration among the Yupik is the high incidence rate of suicide and accidental death (15). In the Bering Strait region, the greater access to alcohol may be partly responsible for high rates of death and particularly, suicide. The Alaska Native statistics of accidental deaths and suicide are very high for much of Alaska, but the area inhabited by the Yupik are exceedingly high. Mark Cardinal (16) reports that Nome's 1980 statistics for suicide are about twice as high as nearby Bethel. Nome's combined death rate is 415 per 100,000 population. As with previous studies, this specific area's death rate exceeds Alaska as a whole.

Other mental health program considerations with the Yupik should include attention to:

(1) **Language and education.** The Yupik language was suppressed by early American contacts, the policy at the end of the 19th century was intensely opposed to the Russian approach of bilingualism. As a consequence, the Americans stressed deculturation of Native people (17). Mohatt, McDiarmid, & Montoya (5) point out with the changes in values toward western education, there has been the creation of a status hierarchy based on education (and the English language). Younger generations are accorded greater levels of power and prestige upon receiving higher levels of education in English by the American society. This creates a conflict across generations where the old Yupik value of knowledge was placed on the experience of the community elders. Animosity is created when the young people return to St. Lawrence Island with this new status of "educated" (18).

(2) **Patterns of Living.** During World War II, many Yupik fathers left home to go to work on the mainland and years later, many mothers also began commuting to the mainland. The schools that were built in the villages only went up to the 8th grade. Boarding schools were therefore needed but were built in Nome and other mainland locations. As a consequence, the pattern of living changed where the Yupik regularly moved away from home to attend school. One of the problems that accompanied this change was the importation

of alcohol and drug abuse(19).

(3) Parent's Role. As the Yupik father's presence diminished with his commuting to the mainland, the mother's role changed. Mother was left with an increase in responsibilities, including "setting the rules". This was regarded as unusual, because traditionally, the father set the rules, she enforced them. Consequently, her own authority was also undermined. The consequence of the changing family role has been role reversal, diminishing value of traditional authority figures, and the undermining of maternal authority.

(4) Social Support System. The value of community changed during WW II to one based upon economic dependence outside of the immediate Island support system. The commuter lifestyle was inaugurated. Neighbors were no longer looked upon as a part of the family's immediate support if needed.

SUMMARY AND DISCUSSION

This article has discussed the present cultural problems in an historical context. There are several cultural considerations to be made in mental health program planning with the Yupik. These include issues of historical trauma, forced acculturation, multi-generational traumas, and dysfunctional support systems — all systemic in nature. The suggested interventions of family/systems and group therapy would address the heart of the matter — the group or family as an entity needs to be healed.

There are increasingly new perspectives in therapy that are developing which may also be integrated into family systems interventions. Gonzalez, Biever, and Gardner (20) suggest that social constructionism, because of a relatively culture-free paradigm, offers a solution to cross-cultural psychotherapy.

Jordan (21) and other authors (22,23) describe the importance of culture specific traditional approaches to treatment. One suggestion, based on present day American Indian mental health practices is that shamanistic healers could work with other mental health professionals and bridge the gap of the acculturation process (24).

In addition, some older theoretical constructs could be revisited to reintegrate into existing family models. One such example is the existential model applied to Native perspective (1). Jordan offers American Indian examples of interpretation

of the four classic existential crises that he believes need to be addressed in suicide prevention. However, some cross-cultural approaches are not without problems of their own. Sue and Zane (25) describe problems with treatment approaches emphasizing either cultural knowledge or culture-specific techniques. Their primary concern was the discrepancy between cultural knowledge (presumably by a non-traditionalist) and actual hands-on concrete operations and strategies working with a specific cultural group.

It is hoped that the Native Corporations of Alaska, such as the Bering Strait Native Corporation - will utilize some of the suggestions in this article. There is an immediate need for charting the course in community mental health with the Yupik. This direction can be based upon Yupik culture and self determination.

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Note . . .

Throughout this article the terms American Indian and Indian are used interchangeably. This is congruent with the National Congress of American Indians 1978 resolution that indicates those peoples indigenous to North America, including Alaska Natives, Eskimos, and Aleuts. When specific village groups such as the Yupiks are the focus of the content, they are named.

Nutritional Rickets Among Breast-fed Black and Alaska Native Children

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ABSTRACT

Although nutritional rickets remains a problem primarily in developing countries, children in northern climates in developed countries may also be at risk. We reviewed the case histories of five children diagnosed in Alaska during 1993-96. Three of the children were black and two Alaska Native. Their ages ranged from 11 to 20 months and they presented during January, April, and September. All of the children were breast-fed but only two received their milk intake exclusively from breast milk. The presenting complaint included abnormal gait in two children and seizures, bowed legs, and growth delay in one child each. All five children demonstrated a decrease in their height-for-age percentile. The most common physical finding was a rachitic rosary which was present in four children. In Alaska, all black and Alaska Native children (and other more pigmented children) less than two years of age who receive all or part of their milk intake from breast milk should receive vitamin D supplementation regardless of the time of year.

INTRODUCTION

Vitamin D deficiency rickets occurs as a result of low vitamin D intake and decreased exposure to

sunlight. Although today rickets occurs primarily in underdeveloped countries, it remains a risk for infants and children in North America, particularly those with dark skin or who breast-feed (1,2). We report a series of five infants and children diagnosed with vitamin D deficiency rickets by five physicians working at three different institutions.

RESULTS

The five children were diagnosed during 1993 to 1996. Four resided in Anchorage (61° latitude) and one in Ketchikan (55° latitude) (Table 1). Their ages ranged from 11 to 20 months (mean, 15), three were black, and two were Alaska Natives. Two patients each presented during September and January and one during April. All of the children were breast-fed; two received their milk intake exclusively from breast milk and the remaining three children had a history of refusing most non-breast milk products. All of the children also ate a variety of other foods. None of the children and one of the mothers were reported to be taking vitamin supplementation.

None of the children were born prematurely. The presenting symptoms included abnormal gait in two children and seizures, bowed legs, and growth delay in one child each (Table 2). Other physical findings included rachitic rosary in four children and frontal bossing, large wrists, and bowed legs in one child each. Three of the five children had a height-for-age less than or equal to the 5th percentile at presentation and the remaining two had a height-for-age equal to the 25th percentile. At presentation, the height-for-age of all of the children had decreased from earlier measurements.

Four children had an elevated serum alkaline phosphatase. The serum calcium was decreased in four children and ranged from 5.9 to 9.7 mg/dL (mean, 7.9) and the serum phosphorus was decreased in three children and ranged from 2.1 to 4.1

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Table 1.

Demographic features and diet for five infants diagnosed with vitamin D-deficiency rickets; Alaska, 1993-96

Case	Age (in mo.)	Month of presentation	Residence	Gender	Race	Diet
1	11.8	January	Ketchikan	Male	Alaska Native	Breast milk, table food
2	12.9	September	Anchorage	Female	Black	Breast milk
3	20.3	September	Anchorage	Female	Alaska Native	Breast + bottle, refused most non-breast milk, reported to have a possible milk allergy, table food
4	18.3	January	Anchorage	Female	Black	Breast + bottle, refused most non-breast milk Table food
5	14.0	April	Anchorage	Male	Black	Breast, refused other milk intake except ice cream Table food

Table 2.

Symptoms, physical findings, and laboratory values for five infants with vitamin D-deficiency rickets; Alaska, 1993-96.

Case	Symptoms at presentation	Height and weight- for-age percentile	Other physical findings	Calcium in mg/dL *findings	Phosphorus in mg/dL	Alkaline phosphatase in U/L (normal values)
1	Seizure, anorexia, lethargy	25/75	Rachitic rosary, frontal bossing	5.9	3.1	326 (80 to 350)
2	Abnormal gait	1/1	Pot belly, hip click	8.7	2.8	1051 (38 to 126)
3	Bow legs	25/50	Rachitic rosary	9.7	3.9	555 (40 to 417)
4	Abnormal gait	5/50	Rachitic rosary	8.2	2.1	1218 (50 to 270)
5	Growth delay, not walking	1/10	Rachitic rosary, large wrists, bowed legs	6.8	4.1	2278 (50 to 270)

* Normal = 8.8 to 10.8

** Normal = 3.8 to 6.5

mg/dL (mean, 3.2). One child with normal serum calcium and phosphorus values had a serum 25-hydroxy vitamin D level of 6 ng/mL (normal, 10 to 55). Four of the children had a radiological examination of one or more long bones at presentation and all four showed cupping or fraying of the metaphyses typical of nutritional rickets. The fifth child had a radiological examination one month after diagnosis which showed widening of the zone of calcification.

All five children were treated with vitamin D2. Four children received prolonged vitamin D therapy

(up to 4 months) while one child received a one time dose of 100,000 units. Follow-up examination showed reduced or resolved cupping and fraying of the long bones on radiological examination, normalization of serum calcium and phosphate values, and a decrease of serum alkaline phosphatase values. Despite this, the height-for-age of one child remained well below the 5th percentile seven months after treatment for rickets, the height-for-age of a second child improved from the 5th to the 25th percentile six months after treatment but remained below the 99th percentile

which the child maintained before the onset of rickets, and the height-for-age of a third child increased from less than the 5th to the 5th percentile two months after the diagnosis of rickets but remained below the 50th to 75th percentile which the child maintained before the diagnosis of rickets.

DISCUSSION

The five children presented here illustrate some of the diverse presentations of rickets, including seizures, bowed legs, growth delay, and abnormal gait (3,4). Other symptoms may include delayed developmental milestones and generalized weakness. Physical findings include a rachitic rosary, craniotabes, frontal bossing, thickened wrists, bowed legs, and scoliosis or kyphosis. Additionally, infants may have delayed growth, as seen for three of the children presented here. Unfortunately, stunting due to rickets may take years to resolve or may never fully resolve (5) thus emphasizing the importance of prevention. Typically patients have low serum calcium, low or normal phosphorous, and elevated alkaline phosphatase levels although values for all of these may be normal. Roentgenographic evaluation typically shows cupping and fraying of the ends of long bones.

Vitamin D levels increase following exposure to sunlight or nutritional intake. In northern climates, however several factors work together to increase the risk of rickets. Alaska Natives, as well as other more deeply pigmented infants and children, require higher exposure levels to ultraviolet radiation for vitamin D synthesis than children with less pigment. Additionally, ultraviolet radiation must be acquired through direct exposure since it does not penetrate glass windows. This may be difficult to achieve because of low winter temperatures in northern climates. Finally, during some months the quantity of ultraviolet radiation may not reach the threshold required for vitamin D synthesis regardless of exposure time. For example, in Edmonton at latitude 52° and in Boston at latitude 42°, the level of ultraviolet radiation from sunlight is insufficient for vitamin D synthesis from October through April and from November through February, respectively (6).

Nutritional vitamin D intake prevents rickets among most children living in northern climates. This may be attributed to the adequate amounts of vitamin D found in infant formulas (7). Human breast milk, however, contains only 22 IU/L, an amount which will not prevent rickets among infants and children who do not have sufficient exposure to sunlight (8). Thus, breast-fed infants and children living in northern climates have a high risk of developing rickets,

particularly more deeply pigmented infants and children. The five patients in this report all breast-fed and all were either Alaska Native or black. Interestingly, three children also received part of their milk intake from non-breast milk sources.

Health care providers have used two approaches to provide supplementary vitamin D to high risk infants and children. Breast-feeding mothers may take vitamin D; unfortunately, the dose of vitamin D which breast-feeding mothers must take to prevent rickets may be as high as 2000 IU per day, a dose whose long-term side effects for the mother are not known (9). Alternatively, high-risk infants and children may take a vitamin D supplement of 400 IU per day. The definition of a high-risk infant or child, however, has not been determined, particularly with regard to the age and pigmentation of the infant or child, exclusivity of breast-feeding, latitude of residence, and month of the year. The American Academy of Pediatrics recommends vitamin D supplementation for "breast-fed infants who are deeply pigmented or who do not have adequate exposure to sunlight" (8) while the Canadian Pediatric Society recommends that vitamin D supplementation be provided for all infants in northern communities (10).

Our findings suggest that, regardless of the financial source, in Alaska all black and Alaska Native children (and other more pigmented children) less than two years of age who receive all or part of their milk intake from breast milk should receive vitamin D supplementation regardless of the time of year. Other states should develop individual policies which reflect the risk to children living at different latitudes. Less pigmented children should receive careful growth monitoring, particularly during the winter months, and vitamin D deficiency should be suspected if a decrease in the height-for-age, or other signs of rickets, occurs. The usefulness of vitamin D supplementation for these infants has not been adequately evaluated. We were heartened to learn that, using the results of this investigation, a group of Anchorage pediatricians has convinced the Alaska Section of Medicaid Services to provide vitamins to breast-feeding infants.

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Does It Make Sense to Heat Gases Higher than Body Temperature for the Treatment of Cold Water Near-Drowning or Hypothermia?

A POINT OF VIEW PAPER

Wayne Wallace BA, RRT

INTRODUCTION

The practice of heating gases higher than body temperature has been recommended by various groups for the treatment of cold water near-drowning or hypothermia. The procedure was popularized in 1972 by Lloyd et al (1) who essentially had hypothermic victims breathing gases (essentially steam) heated to 50-80 degrees C. This landmark study did show rewarming at these very temperatures but there was a high risk of airway damage. Many individuals and groups have advocated the use of greater than body temperature gas, albeit at temperatures lower than suggested by Lloyd et al, on the premise that there is significant heat transfer through the lung parenchyma to the core thoracic organs. This seemed intuitively to be an elegant low cost alternative to hospitals that lacked other internal rewarming methods such as extra corporeal membrane oxygenation (ECMO), dialysis, peritoneal lavage, or fem-fem bypass. However, there have been problems with this approach. There are varying temperature guidelines for warming patient gases. Most equipment available to providers was simply not designed to safely heat gases to the level suggested by the various groups. The preponderance of literature appears to show a lack of convincing evidence supporting the practice of heating gases higher than body temperature. In short, we seem to be at a point where we need to examine whether or not this practice really makes sense.

GUIDELINES

The state of Alaska guidelines for cold water near-drowning and hypothermia suggest warming gases to 40.5 - 42.2 degrees C as a primary rewarming technique (2); the American Heart Association recommends an inspired gas temperature range of 42 - 46 degrees C in the ACLS textbook (3), while the American Association for Respiratory Care offers no higher temperature range for the treatment of hypothermia or cold water near-drowning in their Clinical Practice Guidelines (4). There are several

other guidelines that all suggest different inspired gas temperature ranges. The consensus among the various guidelines appears to favor a higher gas temperature, but offer no rationale for choosing a particular temperature range. If one accepts the hypothesis that heating inspired gases is clearly beneficial for the treatment of cold water near-drowning then the obvious choice would be to select the warmest possible temperature that is safe to the airways. The literature on human subjects is scant. There is a study of intubated dogs that shows tracheal injury at temperature as low as 40 degrees C (5). There is the often quoted study by Graves and Klein that describes "hot pot tacheitis" in a seven year old ventilator patient at a temperature of 110 degrees F (6). The risk for tracheal injury appears to be more pronounced with intubated patients. The therapeutic temperature also appears to be very close to the maximum safe temperature for the airways.

EQUIPMENT

Most humidifiers in use were manufactured in accordance with the International Standards regulations (ISO). One of the ISO standards for humidifiers is that the humidifier cannot warm gases beyond 41 degrees C within 50 mm of the patient outlet (assuming a standard six foot tubing length) (7). This standard was developed to safeguard patients from exposure to excessive gas temperature. However, this also makes the delivery of air at temperatures within the therapeutic ranges given for hypothermia/cold water near-drowning difficult. Clinicians have developed several strategies to "beat" the various humidifier safety system by:

- Reducing the tubing length to the shortest possible.
- Using tubing of the smallest possible diameter.
- Disabling the humidifier safety systems.
- Tricking the humidifier temperature probe by placing it outside the patient circuit.

- Adding extra humidifiers or heat sources to the patient circuit.

The most popular solution employed in Alaskan hospitals appears to be shortening the tubing to shortest possible length and adding extra humidifiers to the patient circuit. Anecdotally, it is also known from the Alaskan experience that circuits around 30 inches can warm gases to very hot temperatures indeed. Caregivers who opt to use their equipment in such a configuration must do so with great caution and must carefully observe the temperature at all times. Dr. Martin Nemiroff, a noted expert on cold water near-drowning, actually fabricated his own device made of a heating coil and a thermos (8). According to the same article, he was looking for a vendor to make a piece of equipment that would safely heat to the required temperatures when he unfortunately passed away. A quick informal survey of the humidifier vendors present at the San Diego AARC Convention found no one working on a prototype. These "hypothermia systems" run into further problems if the patient requires bag-valve-mask ventilation. Most caregivers have to run the heated humidified gas into the wide bore projection used to attach the oxygen reservoir to the bag-valve-mask unit. To my knowledge, the safety of running heated humidified gases into the reservoir has not been studied. Again, the caregivers are using equipment in ways other than that intended by the manufacturer. Why haven't vendors stepped forward to make a safe and well tested device?

LITERATURE

There are several studies that show significant patient rewarming rates using inhalation gas rewarming. Lloyd et al used inspired gas temperatures as high as 50 - 80 degrees C. This achieved a rewarming rate of .54 - .03 degrees C per hour (1). These patients had core temperatures of 24-30 degrees and therefore were probably not shivering. However, other researchers (9-15) report much higher rates of rewarming of .8 - 1.4 degrees C per hour. It is important to note that these studies were done on mildly hypothermic subjects and shivering was a significant confounding variable. Morrison et al demonstrated that the rate of rewarming depends primarily on shivering heat production (12). Goheen, Giesbrecht et al have done a study that demonstrated that when shivering is pharmacologically inhibited, rewarming via inspired gas is not an effective rewarming strategy. The actual rewarming rate was only .23 degrees C per hour vs. a control rate (no therapy) of .41 degrees C per hour. It is also interest-

ing to note that there was a third group in the Goheen, Giesbrecht study that achieved a respectable rewarming rate of 2.4 degrees C per hour. This rate was achieved using forced air rewarming to the skin (16). Hynson and Sessler did a similar study that compared various methods of preventing operative hypothermia (17). Again the outcome was that forced air rewarming was the most effective treatment to prevent operative hypothermia followed by the heated water blanket. Patients who received no special therapy and those who received the heated humidified gas differed little with regard to operative temperature loss. Finally, there are some reports that potential heat transfer is dependent on minute ventilation (18,19). Guild demonstrated that a 70 kg man could be rewarmed at a rate of .5 degrees C using an inspired gas temperature of 45 degrees C per hour if the minute ventilation was about 10 L/min.

Several authors have concentrated on the thermodynamics of heat transfer in the respiratory system and have concluded that it is simply not efficacious to rewarm a patient using warmed inspired gases alone. Chatburn and Branson noted in their editorial that the respiratory system accounts for only about 21% of the total heat loss in most patients. They also noted that most of the heat loss from the respiratory tract is evaporative (insensible) (20). Hudson and Robinson studied the difference between inspired gas and expired gas during ventilation. They concluded that the theoretical maximum rewarming rate is about .2 degree C per hour based on thermodynamic principles (21).

Romet and Hoskins studied patients who were cooled in a whole body calorimeter. The patients were then assigned to simply shivering under a blanket, breathing a warmed gas (two levels 40 or 45 degrees C), or rewarming in water at 40 degrees C. There were no significant differences between breathing warmed gas and shivering under a blanket. There was an additional unintended effect, i.e. the heated inspired gas seemed to lower the patient's basal metabolic rate (14). In an earlier study, Morrison et al calculated a reduction of 1.4 kJ of heat energy for every 1.0 kJ of inhalational heat added (22). Why this occurs is unknown although Romet speculated that it was due to laryngeal cold receptors.

SUMMARY

There appears to be several areas of concern relating to the continued use of heating gases higher than body temperature for the treatment of cold water near-drowning. The use of heated gases as a primary means to rewarm a hypothermic patient does not seem to be any more effective than doing

nothing at all. These low rewarming rates translate into some very long resuscitations. Even Dr. Nemiroff, who was a strong advocate of using heated humidified gases for treating cold water near-drowning, did not consider the use of warm inspired gases to be a primary rewarming technique. He referred to the use of heated humidified gases as a, "stabilization technique" (23). However, does it make sense to use a technique that is several times slower than other methods of similar complexity? Does it make sense to use a protocol that may in fact lower a hypothermic patient's basal metabolic rate?

There are some major patient safety issues raised by heating gases to high levels. However, there have not been many patients with documented airway damage. I have several hypothesis about why this is so. Few people seem to know how to significantly heat their patient's circuit. If they devise a system that gets to the therapeutic range they usually have second thoughts when the bag-valve-mask is too hot to hold, or the plastic wide bore tubing begins to melt, they will reduce the system temperature on that basis alone. Many of the hypothermic patients who are intubated simply do not have good survival rates, and so we may underestimate the degree of airway damage that occurs. Spontaneously breathing patients will tend to refuse to breathe hot gases which limits their potential for airway damage. However, is this a risk we need to run? Would it not make more sense to heat the inspired gases to close to body temperature and avoid the problem?

I feel that the time has come for the Respiratory Therapy community to come together and work on this problem. The researchers have done their jobs in providing us with reasonable data on which to base a clinical decision. It would seem to me that if a Clinical Practice Guideline for cold water near-drowning or hypothermia were in place it might provide the other groups impetus for updating their guidelines. The bottom line is that patients deserve the best care that we know how to provide, and a clear set of guidelines is an essential first step.

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| <input type="checkbox"/> Kachemak Bay Medical Society | <input type="checkbox"/> There is no local medical society in my area |
| <input type="checkbox"/> Kenai Peninsula Medical Society | |

Full Name _____

Date of Birth _____ Sex _____

Mailing Address _____

City _____ zip _____ Phone # _____

College of Medical Graduation _____ Year _____

AMA Medical Education Number _____

Year of Alaska License _____

Medical Board Specialty _____

If elected into membership, I agree without reservation to conduct myself professionally and personally according to the Principles of Medical Ethics and to be governed by the Constitution and Bylaws of the Alaska State Medical Association.

Applicant's Signature _____

Please return this application and membership dues to ASMA, 4107 Laurel Street, Anchorage, AK 99508
(Fax 561-2063).

PHYSICIAN IMPAIRMENT AND HEALTH: A BRIEF OVERVIEW

Larry S. Goldman, MD

In 1972, the American Medical Association's (AMA) Council on Mental Health published its report, (1) "The Sick Physician," drawing the profession's and the public's attention to the problem of impaired physicians. The report noted that numerous articles had appeared in the medical literature during the preceding 15-20 years suggesting that substance abuse (including alcoholism), other mental disorders, and suicide were significant health problems among physicians. This AMA report called for (1) all physicians to take responsibility for impaired colleagues, (2) the referral of impaired colleagues to appropriate committees or boards in order to obtain treatment and to protect patients, (3) educational programs for medical trainees about these problems, and (4) the development and implementation of model legislation for states in dealing with impaired physicians.

Although "sick doctor statutes" were already on the books in Florida (1969) and Texas (1971), this report catalyzed a period of increased legislative and regulatory activity. It also led to the establishment of new programs to assess, treat, and/or monitor impaired physicians; new course offerings in medical schools and residencies to educate trainees and to attempt to "inoculate" them against this occupational hazard; and additional research to clarify the nature, risk factors, course, and outcomes for impaired physicians.

During this time (1970s and early 1980s) most of this activity was focused on alcoholism and other substance abuse, and the emphasis was on physician impairment and recovery from these substance use disorders after they had already taken their toll. Eventually every state had developed some program to deal with affected physicians, and as more physicians came (or were sent) forward into these programs, more clinical and epidemiologic information began to accumulate.

First, subsequent studies of addiction rates among trainees and practicing physicians suggested that overall, physicians' misuse of substances was not necessarily greater than that of nonphysicians of comparable age and other similar demographic factors (2,3). While rates of abuse of prescription drugs seemed to run somewhat higher, rates of illicit drugs were quite a bit lower (4). Secondly, there was a growing appreciation for the occurrence in physicians of other mental disorders, particularly depression and bipolar disorder. These conditions were seen both as coocurrent with substance use disorders or simply by themselves. Finally, there were other conditions which caused impairment that were not mental disorders or at least which did not fit well into standard psychiatric nomenclature. In the first group were physical infirmities, including cardiac, musculoskeletal, neurologic (stroke, MS, blindness, etc.), and other conditions (5). The second category consisted of behavioral problems such as sexual exploitation of patients or abusiveness towards patients or co-workers (6).

Many impaired physician programs were developed in conjunction with state medical societies. In some cases this was simply a small, voluntary committee of society members, but certain states began to develop more extensive programs with a professional staff and even medical directors. An ongoing tension has been the relationship between these programs and the state licensing boards (7). The licensing boards, which are charged with a primary mission of public protection, have sought to know as much as possible about any cases of physician illness or impairment. Some states have created "diversion programs," which allow physicians to be referred to health programs without having to be reported to their state licensing boards. States with those arrangements have generally found that they are able to get more physicians to enter treatment voluntarily, often at earlier stages of their illnesses (i.e., before they were so impaired they did something to warrant licensing board reporting or action) (8 9).

As these programs came to enjoy the trust of their licensing boards and of physicians, the scope of types of cases coming to the programs increased. This

(1) Dr. Goldman is Director of the Department of Mental Health, American Medical Association, and Clinical Associate Professor, Department of Psychiatry, University of Chicago.

expanded clinical demand — along with the research findings mentioned earlier — has led the field to a shift from substance abuse and impairment to broader consideration of disorders of all types and incorporation of disease prevention and health promotion.

As the field of physician health has continued to evolve, there has been an ongoing need to disseminate new information about clinical practice, program development, and regulatory issues to practitioners, administrators, and educators. One forum for this dissemination has been a series of international conferences held every 1-2 years which are co-hosted by the AMA and the Canadian Medical Association. These three-day meetings, alternating between US and Canadian venues, generally bring together 300-400 people, mostly from North America and Europe, with an interest in physician health. The most recent conference was held February 7-10, 1996, in Chandler, Arizona. The conference included half-day updates (institutes) on psychiatry, substance abuse, and women's health, as well as five plenary speakers who discussed topics as diverse as women in surgery, spirituality, medical students, the Americans with Disabilities Act, and population-based medicine. Presentations were held on stress in medical schools; managing medical and psychoactive drugs in recovering physicians; intervention strategies for physician health committees; monitoring physicians with personality disorders; fund-raising for physician health programs; national efforts to assist impaired physicians; and the effects of the "health care crisis" on physicians' emotional health, among others.

The next such conference will be held April 29 - May 2, 1998, in Victoria, British Columbia, Canada. The theme, *Managing Our Own Care. Surviving the Health Care Revolution*, will emphasize the effects of the changing health care delivery system on physician well-being. The call for papers (deadline October 31, 1997) is open to a broad range of submissions, with a particular emphasis on: stresses related to changes in health care systems; primary prevention of illness and impairment; needs of particular physician populations such as trainees, older physicians, minorities, women, and IMGs; physical illness and disability; rehabilitation, restraining, and reentry; the relationship between physician factors and medical errors; physician and family self-care and reactions to illness or stress; reactions to bad outcomes and lawsuits; harassment of and by physicians; relationships among hospital programs, state programs and licensing authorities; and dealing with physicians who misprescribe.

For additional information on the conference or to obtain a paper submission form, call the AMA Department of Mental Health at 312-464-5066. Information can also be found on the World Wide Web at www.ama-assn.org or at www-psy.bsd.uchicago.edu/~larry/uchome.htm.

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Careful Facility “Downsizing” Reduces Liability Risks

Use of Inexperienced or Unqualified Staff Threatens Patient Safety

Janet Marsh, a licensed vocational nurse (LVN) (1), worked for more than ten years in the pediatric nursery of an acute care hospital. When the hospital began to reduce its personnel pool, many permanent full-time employees were forced to accept temporary and part-time work. On arriving for work one morning, Marsh was told she was assigned to a short-staffed adult medical-surgical unit. She objected to the assignment, pointing out that she had no experience in caring for adult patients, nor was she trained to perform some of the duties ordinarily required of nurses assigned to the unit. The nursing supervisor overruled the objection and warned Marsh to accept the assignment or face disciplinary action. Reluctantly, Marsh went to the unit where a harried registered nurse rattled off a list of tasks she needed to have Marsh do immediately. One of the assignments was to administer the morning round of medications. “I’ve never handled adult meds, Marsh told the nurse, “and I won’t be able to tell if the correct doses or administration sites have been ordered.” “Look up what you don’t know in the PDR [Physician’s Desk Reference],” the other nurse responded, adding, “Don’t worry, most of these people won’t know the difference if something happens.” Marsh was incredulous and started to protest, but her colleague was gone. Marsh paused for a few moments and then went to the nursing supervisor’s office, where she recounted the conversation with the medical-surgical unit nurse. Marsh got another surprise. The supervisor’s response was, “If you won’t accept this assignment, you might as well go home.” Marsh submitted her resignation that afternoon. A few days later, she heard from a co-worker that a patient in the medical-surgical unit, a prominent local businessman, nearer died as the result of a medication error. Another nurse, who also was inexperienced in caring for adults, had been assigned to the unit after Marsh resigned and had erroneously injected a drug intravenously rather than intramuscularly.

Experiences similar to Ms. Marsh’s, and mishaps caused by inexperienced or untrained staff are increasing, say liability insurers. Like other businesses, many hospitals are “downsizing” or “restructuring.” These terms imply a “streamlining process, including the reassignment of housekeeping-type tasks to

non-nursing staff. Nurses at some facilities claim, however, that downsizing means replacing highly-trained staff with less-qualified, lower-paid aides and asking unlicensed personnel to perform skilled nursing duties (2). Some facilities that cut staff size expect fewer employees to accomplish the same tasks previously handled by a larger personnel pool. Some emergency departments reportedly are using physician assistants and aides to replace experienced ED physicians and nurses.

Hospital professional liability carriers report these additional “downsizing” incidents:

- A patient in a hospital’s outpatient surgery center’s postoperative recovery area suffered a cardiac arrest. The unit, which previously had been staffed only by trained recovery room nurses, was staffed by a nurse, floated in from another unit, who had little experience observing postoperative patients and had not participated in an actual cardiopulmonary arrest code or drill. When the nurse realized the patient was in distress, she called a code, to which an emergency team promptly responded. It was unclear how long the patient had been in arrest, but following resuscitation, the patient was found to have suffered brain damage.

- A hospital contracted with a *locum tenens* agency for additional emergency department staff during peak hours. The agency sent a dermatology resident who had moonlighted as an ED *locum tenens* for one year. During her shift, several ambulances arrived with victims of a car-train collision. The regular ED physician took the most serious case and asked the moonlighter to care for another victim who appeared stable. However, this patient was bleeding internally, a finding the moonlighter did not appreciate. The patient died in the ED as the result of massive blood loss. A *locum tenens* working alone in another ED was unable to intubate a patient who had stopped breathing. After watching the doctor make three unsuccessful efforts to insert an endotracheal tube, a nurse summoned an anesthesiologist, who established an airway and resuscitated the patient.

- An obstetrician was called when one of his

patients was admitted to the hospital in labor. He arrived soon after the admission, evaluated the patient and, following a discussion with the patient and her husband, applied an internal fetal monitor. He then left to make rounds. He wrote orders for the nurses to observe the fetal monitor output and to call him if the monitor indicated any problems. The doctor was unaware that the nurse assigned to the Labor and Delivery unit had no experience with fetal monitors. The nurse failed to recognize signs of fetal distress. The baby was born with profound brain damage. In the litigation that followed, the nurse stated in her deposition that she had never been trained on the use or observation of a fetal monitor. She testified that she thought "observing the monitor" meant "making sure the tape was running."

Fred Cole (3), an attorney who has sued hospitals on behalf of patients who allege they were injured by inexperienced staff, predicts there will be more litigation against facilities in which personnel cutbacks result in what he calls unsafe staffing. "I will argue [in cases being litigated] that in addition to having a liability for its employees' negligence, the hospital has a duty to not conceal the fact that it has fewer or less well trained employees than other hospitals to which my clients could have been admitted. One witness I will call is my client's attending physician, who testified in deposition he was unaware that nurses assigned to his patients lacked the requisite training and experience." Cole concedes that because of limited budgets, a hospital might have to make some staffing changes or cuts. "But," he says, "downsizing decisions should take into account patient acuity and patient safety, and not be made exclusively for economic reasons."

Cole says one of his clients is suing an allergist who permitted an inexperienced aide to inject allergens; an improperly administered injection resulted in extravasation and skin necrosis, eventually requiring plastic surgery. "When patients go to a doctor's office, an emergency department or a hospital, they assume that those people who will diagnose, treat and care for them have the training and experience needed to do so. Few, if any, patients ask their doctor or the hospital staff if nurses and others are qualified to do what they do. They *assume* these people are qualified and that the hospital or doctor wouldn't knowingly expose them to harm. Any staff assigned to a task should be able to manage problems that are reasonably foreseeable. The public has a right to expect that the person asked to observe and administer care to a hospitalized patient is able to identify the problems for which the patient is being observed,

and can react to those problems in an appropriate and timely way. Punitive damages may be warranted in cases in which it is evident that hospitals or physicians violated this precept intentionally by allowing unqualified staff to provide medical or nursing care. Just as hospitals are required to inform patients that residents and medical students may assist in providing care—an obligation some facilities carelessly discharge—they should be required to let the public know if they can not provide safe levels of staffing. It is, simply, an informed consent issue."

Safe hiring, orientation are required

These safeguards protect hospitals and physicians and reduce liability exposure:

❑ **Hire qualified personnel.** Check all applicants' credentials and references. Choose registries and *locum tenens* agencies with care. If the agency is responsible for verifying credentials, ask it for copies of an applicant's degrees, licenses and references. When employing part-time nurses or physicians, determine if they have had adequate experience in high-risk units, even if they will be assigned only on a temporary basis. Anticipate the skills new, permanent or temporary employees will need in units to which they will be assigned, and verify that they possess these skills. When contracting with an agency, ensure that it has liability coverage for personnel it supplies, if these individuals will not be covered by the facility's professional liability policy.

❑ **Orient new employees.** Give new or temporary employees adequate orientation to the facility and to the units to which they will be assigned. Similarly, orient staff who may be experienced in one unit, but not in others into which they may float. The "buddy" system of orienting new employees by having them tag along with experienced staff can be effective, but its main limitation is that it exposes the new or floating employee only to specific situations that arise during orientation. Hospitals that anticipate having to float nurses to several units should orient these nurses in advance of assignment. Formal orientation programs should cover key policies and procedures, as well as tasks and situations that can be expected to arise in the unit. Use a skills assessment process that demonstrates a new employee's proficiency in accomplishing tasks that will be assigned. Document their satisfactory completion of orientation and skills assessment.

❑ **Require inservice on equipment.** Don't permit any staff to use equipment or machinery or

perform a procedure until they have been oriented to it and have demonstrated proficiency.

❑ **Provide adequate supervision.** The person supervising a new employee or an experienced employee new to the unit should be knowledgeable about the unit's policies and procedures, and have experience with the tasks the new employee will be assigned. A person is not necessarily qualified to supervise in a medical or hospital facility solely because he or she is in a higher employment or professional class than the person being supervised. Such a supervisor may be unable to evaluate the supervised employee's ability to satisfactorily perform tasks specific to the unit.

❑ **Offer inservice about the hospital's "chain of command."** Hospital employees should know how to report an incident or submit a concern about their ability to perform an assigned task. Employees should know what to do if an initial effort to have a concern resolved is not successful. Those responsible for resolving complaints should acknowledge reports or questions and assure the employee that the matter will be investigated. Keep the employee informed about delays in the review process. Hospitals should not take punitive action against employees who in good faith report a problem or express professional concerns for a practice or policy. Hospitals reduce their liability exposure, and increase staff confidence and loyalty, by giving serious consideration to employees' concerns for patient safety.

❑ **Conduct continuous quality improvement.** The facility should have an effective mechanism for reviewing the quality of work of its staff. Quality assurance should include concurrent and outcome reviews, and evaluate documentation.

When reasoned protests fail

Nurses and other health professionals who admit to being uncomfortable about new assignments or being floated temporarily into a unit with which they have no experience may be reluctant to object for fear of losing their jobs. The choice these people make when they elect to remain silent," says attorney Cole, is to save their job, even if it means endangering patients. This is unacceptable. In addition to protecting the public against dangerous staffing practices, we must make certain that no professional is punished for refusing to go along with unsafe practices." The attorney suggests these actions for health professionals who are asked to perform tasks for which

they do not feel qualified, and which therefore may put patients at risk:

"1. Protest, orally and in writing, through the chain of command. If a supervisor is not responsive, go to the next level of authority. Be objective and professional when expressing concerns. Document your actions.

"2. Ask the hospital's attorney for a legal opinion about your own and the hospital's liability in the event you accept an assignment for which you believe you are unqualified and something goes wrong. In some states, nurses who act contra to their professional judgment risk the loss of their license or face disciplinary action. Hospitals could have a significant liability for assigning tasks to a person they knew or should have known was unqualified, especially when that person objected out of concern for patient safety.

"3. If protests through channels fail, submit your resignation. Objectively explain your reasons for resigning. Considering getting independent legal advice. As unsettling as it may be to consider resigning from a job you may need to support yourself and your family, remember the reason you became a health professional. The medical profession's prime directive, 'first, do no harm,' applies to nurses and other health professionals as much as it does to physicians.

Postscript: Soon after she submitted her resignation and requested the hospital counsel's opinion about her potential liability for performing tasks she did not believe she was competent to do, Ms. Marsh was reinstated. In addition, the administration agreed to meet with the nursing staff to review concerns about patient safety and staffing patterns, and to enlist the nurses' help in developing a workable, safe approach to downsizing and restructuring the hospital's support staffs.

Notes

1. Not her real name.
2. In February, 1995, a nursing union filed a "consumer fraud" suit against a Berkeley, CA hospital. A nurses' group says the case will test the trend of hospital restructuring in which tasks are shifted from registered nurses to aides and other lower paid staff.
3. "Fred Cole" is an experienced litigator who requested anonymity for this article. His firm has represented doctors, hospitals and patients in malpractice litigation.

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Dr. C. Earl Albrecht.

Photo courtesy of the Division of Public Health Education, Pennsylvania Department of Health.

In Memoriam

C. Earl Albrecht, MD

June 25, 1905 - July 18, 1997

Dr. Albrecht was described by John Middaugh as “the visionary, the charismatic, the politician, the recruiter.”

John Tower remembers being recruited. Earl Albrecht came to his home in New Haven, Connecticut to persuade him to come to Alaska. Dr. Albrecht needed a pediatrician in the Alaska territorial health department in order to secure federal funding. When John arrived in Juneau he found several others also there for the job!

For such a productive and varied career, it would be difficult to decide what is most outstanding. Certainly, the work leading to the establishment of the International Union of Circumpolar Health must be considered. A meeting in Fairbanks in 1967 which included a representative from the Soviet Union revealed how much there was to learn about the health problems of the Far North. The most recent meeting was in Anchorage in 1996. By then, pressing problems such as tuberculosis, whooping cough and measles had been largely replaced by disorders such as seasonal affective disorder, HIV infection and by environmental health issues. Earl Albrecht was unable to attend that Tenth Congress, but he was aware that altogether the international meetings had attracted 2,000 papers from 21 countries.

Conrad Earl Albrecht was born on June 25, 1905 in Bruederheim, Alberta, Canada, a German-speaking community. Young Conrad learned to speak and

write German there. His father was pastor of the Moravian mission. The church and its music held strong sway over him. Music became a lifelong source of pleasure.

He attended a one-room school and later was graduated from high school in North Dakota. Since it was expected that the oldest son should follow his father's profession, Earl was sent to the Moravian College and Theological Seminary in Bethlehem, Pennsylvania. Dr. Joseph Romig, of Alaska fame himself, influenced him to become a doctor. During the Great Depression, Albrecht attended Jefferson Medical College in Philadelphia. Because he entertained thoughts of practicing in Alaska, he studied as many medical disciplines as he could. He took a three-year residency at Abington Memorial Hospital, becoming chief resident physician and surgeon.

The Anchorage Railroad Hospital offered him a job. He arrived in June 1935. Dr. Albrecht was there only three weeks when he was sent by Dr. Romig to the Matanuska Valley. There was a nurse there but no physician. Children were dying and settlers were in a panic. He spent the next six years in an exhausting but thoroughly satisfying practice. He helped design a hospital for Palmer, which has grown in size over the years but still occupies the site he originally selected.

He entered the military as Captain Albrecht on December 1, 1941, one week before Pearl Harbor.

He was assigned to nearby Fort Richardson Hospital and was placed in charge of a ward full of soldiers with surgical and other infections. He left the army as a Lieutenant Colonel in June 1945, immediately to take up duty as health commissioner for Alaska. At once, he was face-to-face with the enormous public health problem of rampant tuberculosis. Rates among Alaska Natives were the highest in the world.

The F/S Hygiene was in service in Southeast Alaska as a floating clinic, administering to patients in coastal and island villages with tuberculosis and other afflictions. Dr. Albrecht bought and refurbished the larger M/S Hygiene for similar use in Homer, Seward, Kodiak, the Aleutians and the Bering Sea. At first, the M/S Hygiene plied the coast for only six months of the year, but eventually it visited Alaska villages and towns year around. Other vessels were also pressed into service: the M/V Yukon Health sailed the 1400-mile Yukon; the Hazel B the 500-mile Kuskokwim.

Dr. Albrecht fitted out two railroad cars: one was a clinic and the other housing. They rolled along the railbelt mainline and sidings to access inhabitants within the interior of Alaska. He also used a truck to reach villages along the Glenn and Richardson Highways. The doctor, nurse, and lab and x-ray technicians stayed nights at road houses. An airplane carrying an x-ray machine was used to get to remote villages.

The number of cases of tuberculosis cases continued to rise until 1954. During these terrible years, a schoolteacher once observed that of 30 students enrolling in school only six would live to complete high school. After 1954, the prevalence of active cases dropped dramatically with the advent of effective drugs, INH and PAS. Alaska was one of the first places where these drugs were used extensively.

The opening of the Alaska Native Medical Center in Anchorage in 1953 provided welcomed beds. Dr. Albrecht ordered tuberculin tests for all children. His massive attack on tuberculosis speaks clearly to what Earl Albrecht accomplished as the first full-time commissioner of health for Alaska.

Territorial Governor Ernest Gruening appointed Dr. Albrecht to the Board of Regents of the University of Alaska.

Dr. Albrecht was also intensely interested in the problems of mental health. In Alaska, the insane were routinely placed in jail, and their fate was decided by a jury of six chosen almost at random. After he left Alaska in 1956, he helped shepherd the Alaska Mental Health Act through Congress.

He departed to become assistant director of Ohio's Department of Mental Health and Corrections. From there he returned to Pennsylvania, ultimately

to become professor of preventive medicine at Jefferson Medical College. He was always a teacher.

In 1971, the doctor returned to hands-on practice of medicine with the College Medical Center in Anchorage. He practiced there during five winters, enjoying it immensely. Then, after the Albrechts bought a farm near Roanoke, Virginia, the doctor returned during the summer to cover for colleagues in the clinic on vacation. In addition, he participated in the WAMI program by teaching medical students preventive medicine and public health administration.

In 1979, Helen Beirne, Commissioner of Health and Social Services, sent Earl Albrecht to survey the problems of alcohol in the Bush. Dr. Albrecht spent three summers studying the problem, concentrating on Barrow, Kotzebue, Nome, Bethel, Dillingham and Ketchikan. He recommended limiting the number of outlets and their hours, raising state liquor taxes, prohibiting sales to the intoxicated and transporting inebriates to treatment centers.

Dr. C. Earl Albrecht led a life of commitment to people with problems. That he was successful with resolving so many of these is a tribute to him; the International Union for Circumpolar Health is his legacy to the world.

Dr. Albrecht, the apotheosis of a medical activist, died July 18, 1997 in Bradenton, Florida. He was buried in Winston Salem, North Carolina.

His wife, Margery, and his children and grandchildren suggest contributions to the Albrecht-Milan Foundation of the American Society for Circumpolar Health.

Gerl Egelston dies . . .

The *Out of the Past* section of the last issue of *Alaska Medicine* featured a picture of Gerald Egelston, erstwhile manager for educational services for Lederle Laboratories. Those of us who have been here since the 1950s and 60s will recall Geri as the urbane, engaging man who year after year arranged for the Lederle Symposium, always at Fur Rendezvous and always at the Anchorage Westward (now Hilton) Hotel. The meetings featured three giants of American medicine, almost always men. In those days, the sessions constituted about the only regular CME (not called that then) in Alaska. Lederle would favor other communities in the nation with similar symposia but usually only once or only once every several years. Geri brought his show every year starting in 1958 for 21 years. He would entertain the officers of the Anchorage Medical Society the night before with a sumptuous dinner. So fond of Geri (or the banquet) was the Anchorage Medical Society

that it made Geri an honorary member.

Some of us like Vern Cates, George Halc, Bob Billings, John Tower and me kept up with Geri long after the symposia became less useful and less popular and Geri stopped coming to Alaska.

Egelston was a colonel in the Army in the Pacific during World War II, a former professional opera singer, a name dropper and a multilingual bon vivant. He would often break, sotto voce, into passages of beloved operatic arias.

He had aortic valve and coronary artery surgery in May. Pulmonary embolism and acute cholecystitis followed. Gwynneth and I visited him in a rehabilitation hospital in Haverstraw, New York, in June. In July, I sent him the issue that featured his picture. He showed it proudly all about the hospital.

Gerald Egelston died in Nyack, New York, on July 29 at age 82. Adio, caro amico.

Rodman Wilson, MD

(continued from page 74 - Rickets)

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(continued from page 77 - Near-drowning)

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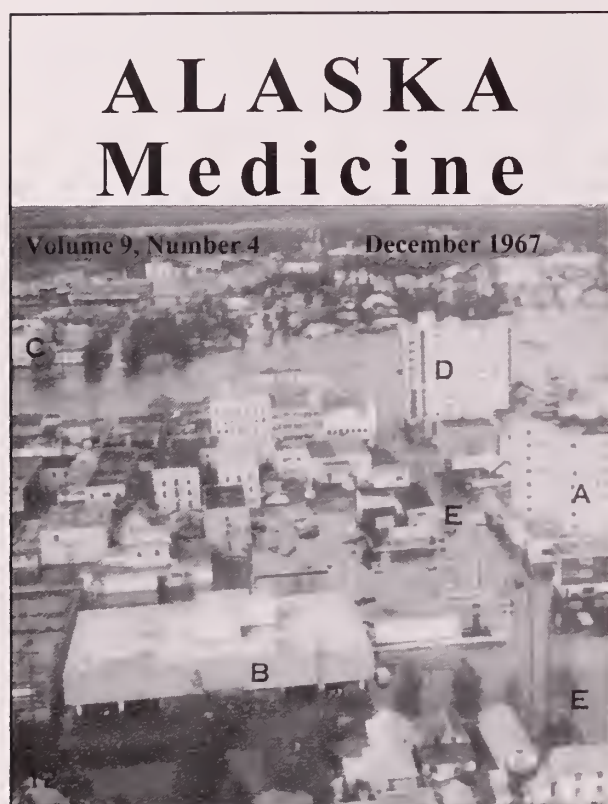
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Meeting Notice

April 29 - May 2, 1998: International Conference on Physician Health sponsored by the American Medical Association and the Canadian Medical Association, Victoria, British Columbia, Canada. Abstract and registration information contact: E. Tejcek, Project Manager, 312-464-5073 (tel), elaine_tejcek@ama-assn.org (e-mail), 312-464-5841 (fax).

From Out of the Past — Thirty Years Ago...

The 1967 Fairbanks Flood



Downtown Fairbanks from the Air

- A. Northward Building
- B. Fairbanks Clinic
- C. St. Joseph's Hospital
- D. Polaris Building
- E. Lacey Street

The photographs of Fairbanks were taken by Dr. Nicholas Deely on a return helicopter flight from Bassett Army Hospital, 24 hours after the China River had passed its crest.

Following are excerpts from several articles in Alaska Medicine (1967) to give an overall idea of clinical problems seen, but specific data was not kept due to clinic facilities in several areas having poor communication with each other. Lack of a coordinated communication system was definitely the most major problem in handling the entire disaster.

Fairbanks Flood Overview — by James A. Lundquist, M.D.

The area inundated was 50,000 square miles, equal in area to many of the States to the South. Essentially all of Fairbanks and almost all of the surrounding areas were flooded.

It is estimated by Civil Defense that 15,000 people were forced out of their homes, but this is counting only those people lodged at the University of Alaska, the high school, Barnette School, and the airport. When all the others who stayed with high-ground

friends (as we did) and who camped out in the hills are added, the total number comes closer to 30,000 people (including those in Nenana - which was flooded over the rooftops).

Of all local medical facilities our offices fared the best in that we were partially staffed and functioning most of the time, although we had a basement full and a few inches of water through the first floor. The Fairbanks Clinic had a basement full and almost 5° feet of water through the first floor. Dr. Storr's office was damaged severely. Dr. Bugh and Dr. Weston were kept out of their offices by the high water, although their examining rooms received no damage. Professional Pharmacy opened again the evening of 14 August and was open 24 hours a day throughout the emergency, being the only source of drugs other than the Bassett Army Hospital. St. Joseph's Hospital patients were evacuated to Bassett Army Hospital the night of 14 August.

During the days of the flood the local doctors had dispensaries operating at this office, at Barnette

School, at the Airport, on Farmers Loop Road at the KFAR transmitter, and outpatient and inpatient clinics at Lathrop High School and at the University of Alaska. It is interesting to observe that the fear of a typhoid epidemic that was prevalent south of the Chena River (where typhoid immunizations were given to very large numbers of people) was unfounded. The area north of the river served as a control group in which very few typhoid immunizations were given. No proven cases of typhoid are known to me. Nor were fears of epidemic diarrhea well-founded, for few cases have occurred. Whether infectious hepatitis will be a problem remains to be seen, but little if any is seen thus far.

In my own experience bronchitis and lobar pneumonia have been seen in almost epidemic proportions. Acute pharyngitis, apparently not streptococcal, has been common, also.

The flood provided an interesting experience for all of us here; and, almost without exception, each of the physicians in Fairbanks suffered a significant financial loss. It has been estimated that the flood damage will cost this community \$200,000,000.00. I rather suspect that this estimate covers major physical damages only and excludes the military losses and the loss of personal property and loss of income. I would suspect, all things considered, that Fairbanks and the surrounding country lost \$400,000,000.00 - not an insignificant amount.

The Fairbanks Flood - by Jack H. Petajan, M. D. Chief, Physiology Section, Arctic Health Research Laboratory, Fairbanks, Alaska.

The 14 August 1967 flood in Fairbanks, Alaska, was of history-making magnitude. The city is accustomed to almost yearly flooding during the spring thaw when melting ice and ice jams on the Chena river cause water levels to rise above flood stage. Nearly a month of virtually continuous rain between mid-July and mid-August, equivalent to the melting of 50" of snow in one day, caused a steady rise of the Chena and Tanana Rivers between which the city lies. Time and height predictions of the river's crest were totally inaccurate and thus most people were caught unaware by the icy cold water which rose many feet above any previous flood level. An area the size of the state of Alabama was inundated. Only a few individuals escaped having the first floor of their homes awash, and major structural damage was commonplace. Many basements collapsed, houses were moved off foundations, and basement floors were heaved up. In some cases, houses were simply washed away.

The Fairbanks area includes about 45,000 people—

all of whom were affected by the flood. Patients in the local hospital, located on the Chena River, were evacuated to the Bassett Army Hospital which was without heat, water, or sewage facilities and operating on emergency power. People sought refuge in the surrounding hills, primarily at the University of Alaska, in College, which was a shelter for approximately 10,000 people early in the disaster. The local high school, which is upon slightly higher ground but still on the flood plain, became the shelter for about 6,000 people. Other schools sheltered smaller numbers of people. Since Fairbanks lies in the midst of a vast unpopulated area, there are no nearby communities to which residents could be evacuated. Children and the ill were evacuated to Anchorage by plane. Anchorage extended a warm life-saving hand to Fairbanks by caring for its children and sick while the city struggled to regain its footing. All people not directly concerned with rehabilitation efforts were encouraged to leave. Repeated earthquakes, although called small aftershocks of the June quake, served to heighten anxiety, especially since many homes were held up by temporary supports.

It is truly amazing that only six individuals lost their lives as a result of the flood.

Within the first 24-48 hours, six patients had grand mal seizures. In four of these, withdrawal from alcohol was clearly implicated; in one, suspected; and in one, a history of neurological disease was present.

Fortunately, medication was available for epileptics (three cases) and diabetics (three cases). Insulin was supplied by boat to diabetics within the vicinity of the high school.

During the first five days, as many as eight hand or foot injuries were seen per day. A total of 106 cases of such injuries were treated. Individuals walked barefoot or sustaining even minor abrasions all developed areas of extensive cellulitis about the wound; and in some instances, multiple cavernous abscesses were seen, especially on the heel or ball of the foot.

One-hundred nine upper respiratory infections were treated, 46 of these being pharyngitis.

Emotional stress reactions were surprisingly few in number—only ten cases requiring medical treatment.

Gynecological Problems - These are of some interest since with the advent of the "pill", a new disaster hazard presents itself. Most women were without their medication and began to menstruate within three to four days after arrival in the shelter. A sudden great demand for sanitary napkins developed which, fortunately, could be met. All pregnant women were required to register but no deliveries occurred in the shelter.

Luctor Et Emergo * - by Nicholas Deely, M.D.

As stated previously, we were very fortunate in not having any severe epidemics, traumas, or severe isolated medical problems.

It is important to note here that the pillar of the medical setup in Fairbanks was unquestionably Bassett Army Hospital at Fort Wainwright. Our assurance to the patients, our confidence in ourselves, and our ability to act was predicted on the assistance, cooperation and concern of this military medical staff. The citizens of Fairbanks and the Fairbanks medical personnel both own their undying gratitude to Bassett Army Hospital.

Medical Activities - University of Alaska Flood Refugee Center - by Joseph A. Worrall, M.D.

An infirmary in Wickersham Hall gave us a twenty-bed holding capability. Communications with Bassett Army Hospital were adequate and helicopter evacuation could be obtained whenever necessary. We had the capability to do obstetrical deliveries if necessary. There was one delivery in a dormitory, attended by a nurse. Several women were evacuated to Bassett in early active labor.

The public health functions at the University were not ignored. We enjoyed full cooperation from the University officials in such matters as sanitation of the dormitories, the control of the very large dog population and testing of water supplies. We anticipated a rat problem at the University because of high ground. Many rats were reported at the University dump, but to my knowledge only one rat bite occurred and this was not at the University.

The inhabitants of the Pioneer home were evacuated as a body to the University, but were both physically and administratively kept separate from the rest of the medical effort at the University.

Flood Watching from St. Joseph's Hospital - by Sister Conrad Mary, FCSP, *Administrator, St. Joseph's Hospital*

The St. Joseph's Hospital patients were transported by ambulance, taxi, and private car, the last patient getting across the bridge just before it was closed to traffic. Many volunteers helped with the evacuation and the sixty-three patients were out of the hospital within one and one-half hours.

We were called time and again for medicine, syringes, needles, diapers, dressings, and blankets—any need that we could fill from our hospital, by now sitting in about ten feet of water.

For about a week the census in the hospital ranged from 12 to 16. The Sisters, one doctor, a few of our help who were unable to get home, and three engineers.

The central supply department and the surgery pack rooms were completely flooded. The electrical panel was all under water. Two emergency generators that were dry could not be used as their wiring was through this same panel. The drug room, and drug storage, the main hospital storage, the freezer and all the food storage, and the hospital telephone equipment were all flooded and a total loss.

The Fairbanks Flood As Seen from Anchorage - by Arndt von Hippel, M.D.

The Fairbanks Flood was a natural disaster of major proportion, but the citizens response to it was far more impressive.

Interestingly enough, there was no real warning of the impending flood, and when it struck the initial rapid rise in water level made immediate escape the major problem in many parts of town.

One hold-up was reported that involved a get-away boat and an attic window. Looting apparently was not a major problem, possibly because of the military presence, possibly because of the high and muddy waters, or possibly because of the spirit of the people.

The salvation of the Fairbanks area was air transportation, particularly the Air National Guard unit from Anchorage, as all area-wide ground transportation, including the railroad, was wiped out. With this in mind it is interesting to note that for several days the water level went above the taxiways but never quite reached the main airport runway. With only a slightly higher water level the runway could not have been used.

After a few days, when the extent of flooding and the probable duration of population displacement became apparent, the Air National Guard was given the added task of relieving critical congestion by evacuating about one-third of the Fairbanks population. Anchorage was prepared when the 5000 refugees arrived, and the entire transfer went smoothly.

Accurate lists were started and maintained of available housing, almost entirely in local homes; and evacuation centers were staffed at both the Kulis Air National Guard Base and at the commercial terminal in Anchorage's International Airport.

The hotels had already been packed to overflowing for several days, as the flood jammed Anchorage with canceled tours and displaced tourists. Even as the evacuation started, at least one major Anchorage hotel already had large groups of male and female

tourists bedded in cots in different meeting rooms and service areas.

Evacuees continued to come by the unpressurized and bumpy Air Guard cargo plane route. With a minimal altitude of 12,000 feet required en route to get past the Mt. McKinley area, many elderly persons and infants "passed out" in flight, some requiring resuscitation. This additional worry made the weary pilots try to stay as low as possible, which, of course, made it rougher yet.

The public portion of the recovery - the repair of roads, sewers, and utilities, was rapid, and was expedited by an influx of men and money. The hospital was very slow in getting back into complete operation, and for many weeks seriously ill patients were evacuated to Bassett Army Hospital and then to Anchorage for care.

The First Special Session - Fifth Legislature - by Milo H. Fritz, M.D.

When the waters receded, the roads, all the utilities and over 90% of the private dwellings and business establishments had been either slightly or severely damaged by the waters and in many instances, destroyed entirely.

Governor Walter J. Hickel called a Special Session of the Legislature, the sole purpose of which was the enacting of legislation that would allow and encourage the citizens and business establishments of Fairbanks to muck out, restore and continue their lives in Fairbanks and the Golden North Borough, as nearly as possible as had been done before.

A completely thought out and well developed package of legislation had been prepared by Governor Hickel and other members of the Executive branch and was ready and waiting for us when we assembled on Friday, the 29th of September at 10 a.m.

Due recognition was taken of the extraordinary efforts of the President of the United States, officials of the Alaska Railroad, the Salvation Army, the Red Cross and others in declaring the Tanana Valley a national disaster area, thus making funds available that otherwise would have been unavailable.

We imposed a tax on each individual who works in the state along with his school tax, amounting to \$10.00, to be terminated as soon as the cost of restoring Fairbanks has been completed. The tax is to continue until a sum of \$7,500,000 has been accumulated in reserve funds against future disasters.

Naturally we made use of federal funds available through the taxation that affects us all. But we did not irresponsibly spend money without providing a source for restoration.

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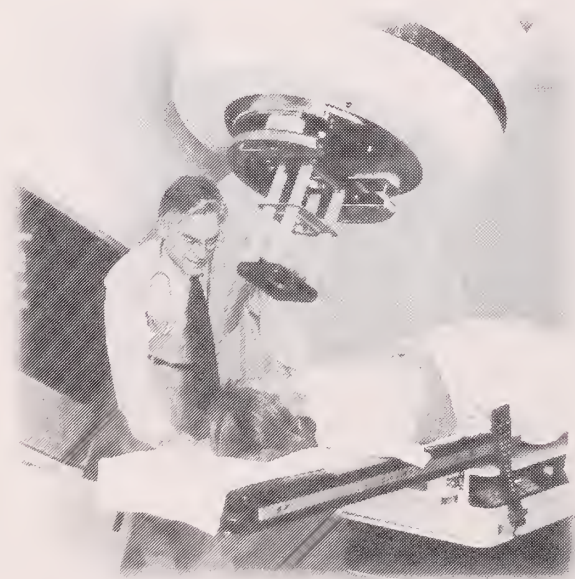
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The Next Challenge for Newborn Intensive Care in Alaska: Improving the
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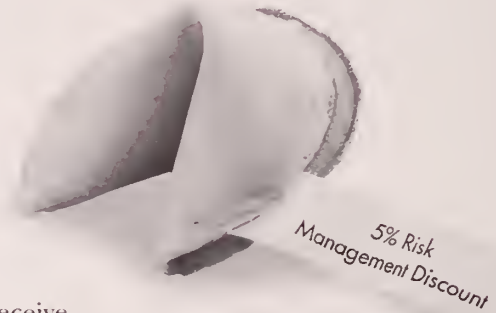
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Comparison of Young and Adult Driver Crashes in Alaska

Using Linked Traffic Crash and Hospital Data

Martha Moore⁽¹⁾

ABSTRACT

This report describes young driver crashes in Alaska, compares rates and characteristics of young driver crashes with adult driver crashes, and summarizes the medical and financial outcomes of young driver crashes, for the period 1991 through 1995. Using the Mini Crash Outcome Data Evaluation System (MINICODES), trauma registry hospital discharge data were linked with traffic crash records. The data were analyzed to compare drivers aged 16-20 with drivers aged 21-50 who were involved in a crash resulting in the hospitalization or death of a crash victim. The CrashCost Program was used to estimate costs associated with young driver crashes for the five years.

Young drivers were 2.9 times more likely than adult drivers to be involved in crashes that resulted in the hospitalization of a crash victim, and 2.6 times more likely to be involved in a crash involving a fatality. The contributing factors for young driver crashes were listed as human factors 73.4% of the time, compared with 65.6% among adults ($P=.001$). Costs associated with the young driver crashes were estimated to be over \$300 million, which resulted in a cost per young licensed driver that was 3.4 times the cost per adult licensed driver.

INTRODUCTION

Motor vehicle crashes are the leading cause of death for young people in the United States aged 15 to 20 years. National statistics reveal that teen drivers are disproportionately involved in crashes. In 1995, young drivers aged 15 to 20 years comprised only 6.7% of the driving population, yet they accounted for 14% of the drivers involved in fatal

crashes and 17% of the drivers in police-reported crashes. The losses these crashes represent in terms of human suffering are vast and difficult to quantify. The financial toll has been estimated at \$31 billion annually (1).

There are a number of factors that impact the driving performances of teens including age, inexperience, supervised driving, and night driving. An examination of the effects of the different state laws on 15-17 year old driver fatality rates found that the minimum legal driving age and curfew laws had the greatest impact on driver fatality rates (2). Delayed full licensure age, night driving curfews, and supervised driving have all been shown to be effective in mitigating the high crash rate among 16 year olds. In upstate New York, however, where a combination of these strategies are employed, crash involvement rates remained low through age 24, compared with the other northeastern states included in the study (3).

The National Highway Traffic Safety Administration (NHTSA) recommends that states adopt a graduated licensing system that combines delayed full-privilege licensure, supervised driving, and night driving curfews. An evaluation of the effectiveness of New Zealand's graduated licensing system, in place since 1987, reveals a 23% reduction in crash injuries for the 15 to 19 year old population (4). Eleven states now have some form of graduated licensing. Evaluations of graduated licensing in California, Maryland, and Oregon demonstrated a 5-16% reduction in young driver crashes (5).

Motor vehicle crashes are the leading cause of death for Alaskans aged 16 through 20 and cause almost 50% of the unintentional injury deaths for this age group. Drivers in this age range were involved in 13.1% of police-reported crashes in Alaska during the period 1991 through 1995 while they accounted for only 6.3% of licensed drivers in the state. This constituted a 107.9% over-representation of crashes in the young driving population. The crash rate of drivers aged 16 through 20 from 1991 through 1995

(1) Alaska Department of Health and Social Services, Division of Public Health, Section of Community Health and Emergency Medical Services (CHEMS) P.O. Box 110616, Juneau AK 99811-0616.

was 135.9 crashes per 1,000 drivers, which was 2.4 times the crash rate of drivers aged 21 through 50 (56.9 per 1,000 drivers).

Among 16 through 20 year old drivers, the crash rate in Alaska decreased each year to age 20. The crash rate of 17 year old drivers was 24% lower than that of 16 year old drivers; the 18 year old driver crash rate was 22% lower than that of 17 year old drivers; the 19 year old driver crash rate was 21% lower than that of 18 year old drivers; and, the 20 year old driver crash rate was 12% lower than that of 19 year old drivers.

The purpose of this study is to describe the most severe young driver crashes in Alaska, to compare rates and characteristics of young driver crashes with adult driver crashes, and to summarize the medical and financial outcomes of young driver crashes.

METHODS

Computerized crash records from the Highway Analysis System (HAS) for 1991 through 1995 were obtained from Alaska's Department of Transportation and Public Facilities. This system contains information on motor vehicle crashes on a trafficway, either recorded by police or self-reported. Alaska law requires that any motor vehicle crash which results in death, injury, or property damage of \$500 or more must be reported to the Alaska Department of Public Safety. Data include passenger demographics, type of vehicle, type of crash, contributing factors, type of injury, and body region injured. There are up to two contributing factors listed per driver involved in a crash, recorded by the enforcement officer. They fall into four main categories: human error, roadway conditions, environmental elements, and vehicle defects.

Hospital discharge data were extracted from the Alaska Trauma Registry, also for 1991 through 1995. The trauma registry is a statewide information system housed in the Alaska Department of Health and Social Services, which includes detailed data on all injury hospitalizations in the state. Alaska's trauma registry is somewhat unique in that trauma data are collected from all acute care hospitals in the state, of which there are 24, and are collected on all patients admitted for 24 hours or more. Data include patient demographics, ambulance service transport and treatment, hospital treatment and length of stay, diagnosis, injury severity, discharge status, charges, and payer billed.

In order to associate circumstances of crashes with corresponding injury outcomes, crash records and trauma registry records were linked using the Mini Crash Outcome Data Evaluation System

(MINICODES), developed by the National Association of Governor's Highway Safety Representatives (NAGHSR) with the support of NHTSA. This software relies on a probabilistic linkage methodology which is particularly useful with data that lack identifiers or may contain incomplete or erroneous information. The methodology has been extensively tested and has demonstrated high precision matching (6).

Trauma registry records were considered for linkage by virtue of an external cause of injury code (E Code) in the range 810.0-816.9 and 819.0-819.9, motor vehicle traffic collision injury. E Codes are a coding system within the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM), which are routinely entered into the Trauma Registry for each trauma patient. The identifiers used for linkage of the two databases were sex, age, birthdate, geographic region, and probable hospital admission date and time. Additional variables were used to review questionable matches. They consisted of vehicle type, crash type, residence city, crash city, position of injured person in vehicle, anatomical location of injury, and the injury description.

Only the most serious crashes were considered for study, i.e. those involving the hospitalization or death of a crash participant. A **hospital crash** refers to any motor vehicle traffic crash resulting in at least one victim of the crash admitted to a hospital for 24 hours or more. A **fatal crash** refers to any motor vehicle traffic crash resulting in at least one fatality. A **fatality** is defined as a death that occurs as a direct result of a motor vehicle crash within 30 days of the injury or during an acute care hospital stay if the patient was originally hospitalized within 30 days of the injury. Through linkage of traffic crash data with trauma registry data, two populations were identified for study: drivers in crashes and victims of crashes. Drivers were divided into two groups, those aged 16 through 20 which are referred to as **young drivers**, and those aged 21 through 50, referred to as **adult drivers**. These two age groups were used for comparison to avoid the introduction of older drivers who are involved in crash patterns unique to their group. The victims of the crashes were described in terms of outcome, hospital charge payment source, and costs. The victims were also divided into two groups, those who were victims of young driver crashes and those who were victims of adult driver crashes.

Safety equipment consists of safety belts, safety belts with harnesses, child safety seats, and helmets. **Alcohol involvement** is recorded as a contributing factor on the police record if alcohol use is confirmed by a test or suspected. **Disability** is defined as the

expectation that the patient will never be able to return to his or her pre-injury level of function in the judgement of the trauma registrar collecting the information from the medical record file.

Cost estimates were derived using the CrashCost Program obtained from NHTSA. Actual hospital charges from the trauma registry were not used because this data element is only about 50% complete. In fact, this information has never been available from the public health service and military hospitals. The CrashCost Program estimates the economic costs of motor vehicle crashes. These costs include direct medical expenses, direct "other" expenses and indirect costs. The CrashCost program also accounts for unreported crashes and adjusts for locality and current economics (7).

The cost estimates were based on Alaska specific data on the number of crash fatalities and the number of patients identified with an Abbreviated Injury Scale (AIS) score of four (severe injury) or five (critical injury). Injuries of an AIS of three or less are not adequately tracked by the trauma registry since only patients admitted to the hospital for one or more days are entered into the database. Therefore, the national ratio based estimates from the CrashCost Program were used to estimate the number of these less severe injuries.

RESULTS

A total of 3,158 trauma registry records were considered for linkage with traffic records, resulting in 2,183 matches, or a 69.1% matching success rate. The linked trauma registry records were compared with the unlinked records to see if the linked records were representative of the unlinked records. There were no significant differences between the groups in sex and age, however, there were significant differences relating to geographic location of crash

and type of crash. The crashes among the linked trauma registry records occurred more often in the urban areas (Anchorage, Fairbanks, the Kenai Peninsula, Matanuska-Susitna Borough, and Juneau) ($p < .0001$). There was a significantly smaller percentage of Alaska Natives in this group than in the unlinked data group ($p > .01$). The mean injury severity was greater among the linked records than among the unlinked records ($p < .05$). The linked data also included less pedestrian injuries ($p < .0001$) and more driver injuries ($p < .0001$) than the unlinked data.

Linkage of traffic crash data with trauma registry data resulted in 2,508 drivers identified for their involvement in hospital and fatal crashes: 488 young drivers and 2,020 adult drivers. A comparison of crash involvement rates of young and adult drivers, annualized over the five-year period, is shown in Table 1. Young drivers were 2.9 times more likely to be involved in crashes that resulted in the hospitalization of a crash victim, and 2.6 times more likely to be involved in a crash involving a fatality.

The young and adult drivers in hospital and fatal crashes are compared in Table 2. The two groups of drivers were similarly distributed by sex and use of safety equipment. Hospital and fatal crashes occurred most often during the summer months (July and August) among both groups of drivers. The time of day of the crash was also similar between the two groups. Adult driver crashes that resulted in serious injury peaked in late afternoon and early evening (25.6%) and young drivers were most at risk between noon and 4 PM (23.4%).

There are up to two contributing factors recorded in the traffic crash database for a driver in a crash. There were a total of 643 contributing factors listed for the young drivers involved in crashes associated with the hospitalization or fatality of a victim, and a total of 2,439 contributing factors for the adult drivers

Table 1 Annualized Young and Adult Driver Crash Involvement Rates, 1991-1995*

	Drivers Aged 16-20 Years		Drivers Aged 21-50 Years		Rate Ratio
	Number of Crashes	Rate**	Number of Crashes	Rate**	
Hospital Crash Involvement	408	3.1	1,659	1.1	2.9
Fatal Crash Involvement	80	0.6	361	0.2	2.6

* Drivers in Hospital and Fatal Crashes, N = 2,508

** Rate per 1,000 licensed drivers

Table 2 Comparison of Young and Adult Drivers in Hospital and Fatal Crashes *
Driver Age, Safety Equipment Use, and Crash Time, Alaska, 1991-1995

	Young Drivers (Age 16-20) N=488		Adult Drivers (Age 21-50) N=2,020	
	N	Percent	N	Percent
Sex				
Male	324	66.4%	1444	71.5%
Female	164	33.6%	579	28.7%
Safety Equipment Use				
Recorded	462		1871	
Used	252	54.5%	1053	55.9%
Not Used	210	45.5%	818	44.1%
Unrecorded	26		149	
Crash Time				
Midnight-4am	90	18.4%	304	15.0%
4am-8am	36	7.4%	187	9.3%
8am-noon	48	9.8%	232	11.5%
noon-4pm	114	23.4%	403	20.0%
4pm-8pm	111	22.7%	517	25.6%
8pm-midnight	89	18.2%	377	18.7%

* Drivers in Hospital and Fatal Crashes, N = 2,508

in similarly serious crashes. As indicated in Table 3, the percentage of contributing factors due to human error among the young drivers, as recorded by the investigating officer, was significantly higher than that of the adult drivers ($p < .001$). Conversely, there was a greater percentage of adult drivers with "no contributing factor" recorded to describe their involvement in the crash ($p = .01$).

The contributing factors of the young and adult driver crashes resulting in a fatality or hospital admission are detailed in Table 4. "Alcohol" was the most frequent contributing factor for adult drivers (20.6%). "Unsafe speed" ranked second at 16.4%. The crash records of young drivers listed "unsafe speed" most often (22.1%), while alcohol involvement among young drivers was noted as a contributing factor 11.8% of the time.

There were 99 fatalities among the young driver crash victims from 1991 through 1995. Of these, 67 died at the scene. A total of 517 victims of the young driver crashes were treated at a hospital. Seventy patients (13.5%) were discharged from the hospital with a disability. The adult driver crashes resulted in 344 deaths, including 228 scene deaths. Adult driver crash victims treated at a hospital numbered 1,666. Of those, 186 (11.2%) were discharged from the hospital with a disability.

The distribution of payers billed for hospital expenses associated with the 2,183 hospitalized victims are presented in Table 5. Of the patients involved in the young driver crashes, the largest percentage billed their hospital expenses to private health insurance (33.1%), followed by those who were uninsured (19.3%), and those covered by automotive insurance (14.7%).

Table 6 presents an estimate of the total costs associated with young and adult driver crashes in Alaska for the five years using the CrashCost Program. Cost per young licensed driver was 3.4 times the cost per adult licensed driver.

CONCLUSIONS

Alaska is similar to the rest of the nation in that young people are disproportionately involved in motor vehicle crashes, and crash injuries constitute a major health problem among this group. Alaska is, however, distinctive by having the lowest population density of any state, about one person per square mile. There are 13,485 miles of roads but only five of Alaska's urban centers are connected by road. The formidable terrain, isolation, and extreme weather conditions make access to medical care a challenge for residents and visitors alike who are involved in

Table 3 Comparison of Young and Adult Drivers in Hospital and Fatal Crashes
Total Contributing Factors, Alaska, 1991-1995

Contributing Factors *	Total Contributing Factors Of Young Drivers, N = 643 *		Total Contributing Factors of Adult Drivers, N = 2,439 *		
	N	Percent	N	Percent	
Human	472	73.4%	1600	65.6%	**
Vehicle	22	3.4%	53	2.2%	
Environmental	23	3.6%	76	3.1%	
Roadway	42	6.5%	124	5.1%	
None	78	12.1%	551	22.6%	***
Unknown	6	0.9%	35	1.4%	

* Up to two contributing factors per driver

** p = .001

*** p = .01

Table 4 Comparison of Young and Adult Drivers in Hospital or Fatal Crashes
Total Contributing Factors, Alaska, 1991-1995

	Total Contributing Factors of Young Drivers, N = 643 *		Total Contributing Factors of Adult Drivers, N = 2,439 *		
	N	Percent	N	Percent	
Unsafe Speed	142	22.1%	401	16.4%	***
Alcohol	76	11.8%	502	20.6%	**
Driver Inattention	59	9.2%	142	5.8%	
Failure to Yield	45	7.0%	144	5.9%	
Driver Inexperience	36	5.6%	28	1.1%	
Pavement Slippery	32	5.0%	107	4.4%	
Improper Lane Usage/Passing	27	4.2%	76	3.1%	
Traffic Control Devise Disregard	24	3.7%	79	3.2%	
Other Human Factor	19	3.0%	81	3.3%	
Turning Improperly	10	1.6%	35	1.4%	
Fell Asleep	9	1.4%	42	1.7%	
View Obstructed	8	1.2%	36	1.5%	
Other (See below for detail)	156	24.3%	766	31.4%	

* Up to two contributing factors per driver

** p=.03

*** p = .15

Other: backing unsafely, illicit drugs, following too closely, passenger distraction, pedestrian error, illness, lost consciousness, prescription medication, physical disability, acceleration defective, brakes defective, headlights defective, other lighting defects, oversized vehicle, steering failure, tire failure, tow-hitch defective, windshield inadequate, other vehicular factors, animal's action, glare, lane marking improper, construction debris, pavement deteriorated, shoulders, signs missing, and other roadway factors.

Table 5 Payers Billed for Hospitalization of Victims of Young Driver and Adult Driver Crashes *
Alaska, 1991-1995

Payer Billed	Young Driver Crash Victims N=517		Adult Driver Crash Victims N=1,666	
	N	Percent	N	Percent
Private	171	33.1%	472	28.3%
Uninsured	100	19.3%	368	22.1%
Automotive	76	14.7%	225	13.5%
Indian Health Service	50	9.7%	174	10.4%
Medicaid	40	7.7%	110	6.6%
Military	24	4.6%	118	7.1%
Champus	12	2.3%	42	2.5%
Medicare	10	1.9%	48	2.9%
Other/Unknown	34	6.6%	109	6.6%

* Hospitalized Victims of Crashes, N = 2,183 (295 scene deaths not included)

Table 6 Cost Estimates for Young and Adult Driver Crashes
Alaska, 1991-1995

	Young Driver Crashes	Adult Driver Crashes
Injury Components:		
Fatalities	99	344
Injuries	7,648	26,569
Property Damage Only	34,333	119,248
Direct Medical Costs	\$36,750,837	\$126,786,020
Direct Other Costs	134,898,306	468,099,927
Indirect Costs	131,086,293	454,729,271
Total	\$302,735,436	\$1,049,615,218
Cost per Licensed Driver	\$2,336	\$697

motor vehicle traffic crashes. Teen drivers demonstrated a greater propensity for involvement in the most severe crashes compared with adults, but the involvement rate did not increase significantly with injury severity.

Among the most serious crashes (those involving the hospitalization or death of a crash participant,) contributing factors recorded for young drivers were more likely to be human factors than those recorded for adult drivers. These data suggest that inexperience and risk-taking behaviors contribute to young driver crashes.

The high percentage of safety belt and helmet nonuse among both of the study populations (44%-46%) is partially explained by the fact that these were the drivers in crashes resulting in the most serious injuries, including injuries to themselves. The Youth Risk Behavior Survey of 1995 reported that about 20% of Alaska high school students surveyed responded that they rarely or never use safety belts. Among those who ride motorcycles, about 40% rarely or never wear helmets (8). In response to the 1995 Alaska Behavioral Risk Factor Survey, 33.1% of adults reported that they did not always use safety

belts (9). These percentages are all higher than comparable national percentages. Lap and shoulder belts are 40-50% effective in reducing deaths and 45-55% effective in preventing moderate-to-critical injuries to passenger vehicle occupants (10). NHTSA estimates that helmets are 29% effective in preventing fatal injuries to motorcyclists and in a recent study showed that motorcycle helmets are 67% effective in preventing brain injuries (11).

Alcohol was not the leading contributing factor in young driver crashes as it was for adult driver crashes. This has been reported by other researchers and can be attributed largely to an alcohol purchase age of 21 in all states and a zero tolerance law for drivers under the age of 21 in 30 states, including Alaska. Zero tolerance means that anyone with a BAC level above 0.02 g/dl is considered legally intoxicated (1,12,13).

Almost 50% of teen crash patients who were hospitalized relied on private or automotive insurance to pay their hospital expenses. One hundred victims, or 19.3%, were uninsured. The hospital charges of an additional 26.3% of the patients were billed to a government program. NHTSA estimates that nationally private insurance companies pay 55% of medical costs for hospitalized patients of motor vehicle crashes and the government pays only 23% (14). Alaska has a large Native American population and several military bases, which contribute to a significant role of the federal government in covering the cost of health care in the state.

The cost estimate for teen driver crashes in Alaska for five years, using the CrashCost Program, was over \$300 million. The financial burden quickly becomes an issue of public policy when such a large percentage of the cost is reimbursed with public funds.

There were several limitations to this study. A driver who is involved in a crash is not necessarily at fault. For the purpose of this study, every driver involved in a crash is charged with the crash under the assumption that in most cases he or she bears some responsibility, and false positives would occur in both groups equally.

Missing and incorrect data is undoubtedly partly responsible for the inability to link all trauma registry records with traffic crash records. The error rate in data linkage due to the linkage process itself has not been quantified. It is believed, however, that the 31% in non-linked data was largely due to unreported traffic crashes. A comparison of hospital discharge files and police road injury data in Australia resulted in a linkage rate of 64%. The researchers found increased linkage with injury severity and varying linkage rates with different types of crashes (29% for

motorcyclists vs. 79% for motor vehicle drivers.) They also noted that the casualties outside the urban area linked less often to a police report than the urban casualties. Their conclusion was that the low linkage rate was largely due to the underreporting of crashes by police (15).

An under reporting of pedestrian injuries was reported by Agran, Castillo and Winn in 1987, in a comparison of police report information with hospital monitoring system information in Orange County, California. It was estimated that police underreported pedestrian injuries by 20%. The researchers also noted that nontraffic incidents were especially underreported, mainly because the police database criteria excludes cases occurring on private property (driveways, sidewalks and parking lots) where a large percentage of pedestrian injuries occur (16). Similarly, Alaska's traffic crash data reporting system excludes incidents on private property, as well as those involving vehicles not customarily used for transport on roads.

Other possible reasons for the under reporting of traffic crashes include lack of police officers in the rural areas, reluctance of crash participants to notify police, and failure of local enforcement personnel to submit investigation forms to the Department of Public Safety.

The mean age of the injured victims of young driver crashes was slightly lower than that of the entire population of injured victims studied (25 vs. 30). Since the CrashCost estimates were based on national averages, the present discounted value of lost productivity for victims of young driver crashes would differ slightly from the value of lost productivity for victims of all crashes. The difference, however, is likely to be minor.

RECOMMENDATIONS

The factors contributing to Alaska's young driver crashes—youth, inexperience, and risk-taking behavior—are analogous to those seen in other states and countries. Currently there is no graduated licensing system in Alaska; however, legislation has been introduced and is currently under consideration during the 1997-98 legislative session. Alaska is also one of few states that does not require any instructional permit prior to obtaining a full privilege license. Graduated licensing has been shown to successfully reduce young driver crashes. It is recommended that Alaska adopt a graduated licensing system that is appropriate for Alaskans, to include the requirement of supervised driving under an instructional permit, a probational driving period, and raising the minimum age for full licensure to 17. The expected result

would be a reduction in injuries and deaths, mitigation of the impact of crashes on Alaska's stretched emergency medical services, and a significant cost savings.

Alaska has a primary safety belt enforcement law for children under age 16 and secondary enforcement for those aged 16 and over. There is a helmet law for motorcyclists under age 18 and all motorcycle passengers. At the least, the primary safety belt law and the helmet law should be expanded to include young drivers through age 20 to protect those drivers at greatest risk. Even more effective are universal laws, i.e. mandated usage for all persons, which have been shown to increase belt usage 10-15% and helmet usage to 100% (10,11).

In the past three years Alaska has enacted two zero tolerance laws for young people under 21 years of age. A minor caught in possession of or consuming alcohol, regardless of motor vehicle involvement, can have his or her driver's license revoked. A minor also can be cited for "driving while intoxicated," for any level of alcohol registered on a breathalyzer test. These laws send an important message to young drivers about drinking and driving in a state that has a major problem with alcohol involvement relative to a great variety of injuries. Full commitment by state and local jurisdictions is needed to enforce these and all other traffic safety laws.

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Chronic Opioids: A Reassessment

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ABSTRACT

Opioids have long been associated with addiction and antisocial behavior. Yet recent experience and studies raise questions about the prohibition of chronic opioids in nonmalignant pain. From a purely pharmacologic point of view, opioids have perhaps the best side effect profile in our armamentarium. Studies suggest addiction is not as dependent on the nature of the drug as it is on the particular patient, some patients being highly addictable while the majority are not.

Successful use of opioids for chronic nonmalignant pain depends on using them only when other measures have failed, when psychosocial and other addiction risk factors are clearly identified, and when guidelines and documentation are meticulous. Then opioids can often be used successfully to achieve good pain relief without undue risk of addiction or other side effects. The endpoint for opioid use is not the absolute dose of medications but rather the balance between benefits and side effects.

Long-term use of addictive substances has for centuries, if not millennia, had a well-earned reputation in folklore and in medical tradition of creating disastrous personal and social consequences. Despite this long negative history, the chronic use of opioid painkillers is being reevaluated by essentially all pain centers in the United States and abroad. Although it is certain that the reevaluation of opioid use is still in process and much remains to be learned, it is also clear that a thoughtful liberalizing of our attitudes and practices is needed and can be beneficial to our patients. This communication will briefly review some of the concepts in this debate.

The Case Against Opioids for Chronic Use

Physicians have grown up in medicine with a solid belief that it is imperative to avoid long-term use of opioids because it leads to tolerance, multiple side

effects, physical dependence, addiction, and worsening disability (cloudy mentation, decreased activity, depression, increased complaints of pain, and poor coping). The risk for addiction was felt to be dependent on the addictive substance itself. Basically it was believed that if anyone in the general population was exposed to these drugs, they would be addicted. A paper in 1954 indicated that more than one-fourth of addicts started with opioids given for pain (1). Many studies describe tolerance and physical dependence with opioid use. There was assumed to be a theoretical, although not proven, link between both tolerance and physical dependence and addiction. Everyone is aware of the high recidivism among addicts. For all these reasons, it has been felt that simply exposure to opioids will induce addiction in anyone. Although this opinion has been held universally until recently, the actual evidence regarding the rate and risk of addiction is mostly anecdotal or based on flawed studies.

In addition, pain clinics have taught that among their patients, those on opioids have more pain complaints, greater physical impairment, greater cognitive impairment, greater tendency to be manipulative, and have a poorer response to the pain clinic than those who are not on opioids. The possibility that some people on opioids may truly have a higher pain level has not been given much credence.

Despite this preponderance of historical opinion, all clinicians know of cancer patients who were given opioids and who failed to die as soon as expected. Some have lived many months or even years on opioids with no problems. In addition, A. Taub, M.D., in 1982 and Howard Fields, M.D., in 1987, as well as others, gradually began to write about some patients with chronic nonmalignant pain who do well with long-term use of opioids, maintaining stable doses, and not having dysfunctional behaviors (2,3). Gradually, a rethinking of our ideas about opioids began. Much of the following is based on the excellent review by Kenneth Portenoy, M.D. (4). We will start with a few basic definitions.

DEFINITIONS

Pain has been defined by the International Association for the Study of Pain (1986) as "an unpleasant

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sensory and emotional experience associated with actual or potential tissue damage and described in terms of such damage.” When managing pain it is crucial to keep in mind what Melzak and Casey (5) call the dimensions of pain:

- (1) The sensory-discriminative part which is described by basic neurophysiologic pathways/phenomena and responds well to opioids;
- (2) affective-motivational or mood dimension, which may respond to antidepressants and/or anxiolytics as well as psychosocial intervention but certainly would not respond to opioids, nerve blocks, or surgery;
- (3) cognitive or coping-suffering dimension, which also may respond to psychosocial intervention but not to opioids.

Opium, from the poppy *Papaver somniferum*, contains morphine, codeine and other active compounds. These substances in opium are called **opiates**. These can be modified to make other drugs, e.g., modifying morphine to produce heroin. Some synthetic drugs have similar effects and similar sites of action. Examples are methadone, meperidine, pentazocine and propoxyphene. Collectively, these medications, being ligands of opium, are called **opioids**.

Narcotic refers generally to substances that can produce deep sleep (death-like). In today’s terminology it refers broadly to those substances covered by the Harrison Narcotic Act of 1914. These include the substances controlled by the Drug Enforcement Agency such as opioids, benzodiazepines, and others.

Physical dependence means that the patient has a withdrawal syndrome when the drug is discontinued, causing an absence of the drug at the neural receptor site. Psychological dependence is similar but is based more on psychological than physical factors.

Addiction is the compulsive use of a substance resulting in physical, psychological or social harm to the user and continued use despite that harm. Being physically dependent or being on opioids a long time are not by themselves signs of addiction.

Drug Abuse is drug use that is harmful and/or outside the cultural norm.

Drug Seeking/Craving may be part of addiction or may be an appropriate search for pain relief (see pseudoaddiction below).

Pseudoaddiction is the aberrant behaviors that are quite similar to addiction that appear in the setting of undertreated pain and disappear when the pain is relieved.

The **Visual Analog Scale (V.A.S.)** is an effort to quantify pain. The patient marks their pain level on a scale from 0 to 10, 10 being the worst pain they can imagine. Unfortunately, this remains totally subjective: the patient reports their pain experience. Their experience depends on nociceptive input and/or emotional and cognitive factors. While putting a number on the pain may be helpful to the physician, it is also useful to the patient who may wish to impress the doctor with the severity of their pain or to minimize their pain, for example for cultural reasons. This subjectivity must be kept foremost in mind when using the V.A.S. to avoid responding as if the nociception is being measured. It is also worth mentioning that physicians tend to underestimate both acute and chronic pain in their patients. This is especially true if the patient shows any psychosocial instability, which of course could coexist with real pain.

Opioid Responsiveness

Whether people respond to opioids depends partly on pain issues such as the pathophysiologic mechanism of the pain. It also depends on patient factors, including age and gender, psychological distress, prior opioid exposure, history of psychologic dependence/addiction, any cognitive impairment, and probably genetic factors.

Organ Toxicity

Despite the extensive use of opioids for many years for acute pain and more recently for chronic pain, there appears to be essentially no documented evidence of major organ toxicity. Even among addicts, negative organ and system effects appear to be related not to the opioids directly but to secondary factors such as needle use, alcoholism, poor nutrition, and other behavioral issues. Nevertheless, there are some persistent side effects with chronic opioid use: constipation, cognitive impairment, nausea, and decreased sexual function, among others. Just as there may be tolerance to the pain-relieving property of opioids, there is usually tolerance to the adverse effects as well, especially the cognitive impairment.

The most frequent persisting side effect is constipation. A secondary effect of opioids, release of histamine, can cause itching and rash and rarely can trigger or worsen a bout of asthma. Concerning the cognitive impairment, two papers on methadone-maintained addicts who drive cars showed no increased rate of infractions of the law and no increased rate of accidents (6, 7). Lastly, the possibility of immune suppression with chronic opioids in animal studies has been raised. There is no confirmation available to date. Overall, the side effect profile of opioids, ignoring the addiction issue for a moment, is much better than many drugs considered safe, including NSAIDs.

Tolerance

Tolerance refers to the durability of pain relief at a particular stable dose. It is due to decoupling of second messengers from opioid receptors and probably other mechanisms. Although physicians have all witnessed the phenomenon of tolerance to opioids, significant tolerance is uncommon once a stable dose is reached, assuming stable pathology. Portenoy reports tolerance does not occur after the first two weeks at a stable level (8). Our experience suggests that one might see tolerance for three or four or even six weeks. I would agree with Portenoy that the amount of dose escalation is usually in the range of 25% or 30% increase beyond the original adequate dose. This often occurs in the first few weeks and then a stable dose is usually maintained indefinitely. Occasionally a late tolerance is seen. In this case, the physician may change medications for a month and then retry the original medication. A. Dickenson (9) indicates that while there are no clinical studies about reversing tolerance, his observation is that abstinence from an opioid for three to four weeks would let the physician restart the same drug at the initial effective dose level with good analgesia again. This matches clinical experience.

Physical Dependence

Physical dependence virtually always develops in patients who use multiple daily doses of opioids continuously for 7 to 20 days. Abrupt cessation of the opioid will then produce the abstinence syndrome: restlessness, yawning, diarrhea, abdominal cramps, diaphoresis, and psychological complaints. To keep this in perspective, we recognize that abrupt cessation of drugs in other categories, such as tricyclics and antiseizure medications, may also produce troubling symptoms suggesting physical dependence. It is common for physicians, and especially pain clinics, to

emphasize the great difficulty in getting a chronic pain patient off opioids. However, the difficulty usually consists of the patient complaining about an increase in their pain. The actual weaning from the opioid has not been a problem in patients in my office or those who have gone to a university pain clinic. If tapering is indeed necessary, the opioid may be tapered over ten days at 10% per day, or perhaps over a longer time since there usually is no great urgency. The administration of diazepam or clonazepam may be helpful in the unusual difficult case.

Addiction

Despite the uncertainty in clinical studies, it is becoming clear that addiction does not depend solely on the pharmacology of the drug. It also depends on predisposing factors such as the individual's physiology (and possibly a genetic predisposition) as well as psychological and social factors in the individual patients. At this time most pain clinics agree that in patients with *no personal or family history* of prior substance abuse and no severe *character pathology* in them or their family, addiction with chronic opioid therapy is rare (10). This is particularly true for the older patient who has a good track record with no addictive behaviors. It is now becoming widely believed among pain experts that addiction risk with careful management of opioids for nonmalignant pain is very uncommon. Nevertheless, it must be recognized that the risk is still not zero.

Although much of our negative feelings about long-term use of opioids is based on poor science, this criticism applies also to studies supporting the safety of long-term opioid use. An often quoted letter from the Boston Collaborative Study indicated that only 4 out of 11,882 patients who got opioids became addicted (11). A national survey of burn units showed none out of 10,000 burn patients who received opioids became addicted (12). A headache clinic reported an analgesic management problem among only 3 out of 2,369 patients (13). It has been reported that some recreational users, called "chippers," use opioids intermittently, discontinuing use when they desire (14). A 1986 report indicates that pain clinics regularly detoxify patients quickly and easily (15). Although these articles suggest safety for opioid use, all have quite significant design flaws that limit their usefulness.

There are a few studies with more convincing experimental designs. A. Taub (16) followed 313

patients treated with opiates for nonmalignant chronic pain. The average daily dose was 10 to 20 milligrams of methadone (or equivalent of another opioid). He found modest tolerance with baseline doses increased 25% or less. Of the 313 patients, 13 (4%) had management problems with their opioids and 8 of them had a prior history of drug abuse. If those eight are eliminated, there were 5 of 313 patients (1.6%) who had management problems with opioids.

Brookoff and Palomano (17) studied patients in their sickle cell clinic using chronic opioids for two years. Their approach was to treat the pain as if it were cancer pain. It is noteworthy that hospital admissions decreased by 44% and emergency room visits decreased by 67%. During the two years they noted no change in the rate of opioid abuse in this population.

Finally, most physicians have seen cancer patients on long-term opioids. They seldom have neuropsychological toxicity, except in the agonal phase, and rarely have management problems due to tolerance or physical dependence. Indeed, they almost never have a correct diagnosis of addiction.

The Case for Cautious Use of Opioids

After reviewing the above ideas, one can conclude that there is new information, there are new approaches and new attitudes about this old issue. These ideas indicate that opioids are biologically safe, that most people are unlikely to be addicted, that physical dependence and tolerance can be managed, and that high-risk patients can usually be identified. Physicians are reluctant to give up dearly, almost religiously held opinions and don't want to stay awake at night worrying about their reputation and their medical license. They also want to practice up-to-date medicine and do the best for their patients. Using opioids to give compassionate care to patients enduring unremitting pain would be acceptable to physicians if they could identify the right patient, the right dose, monitor them correctly, and avoid legal complications for patients and themselves. This is indeed possible, and to treat pain in this way can be quite gratifying. The following sections will describe an approach to these concerns.

Contraindications

Most of the contraindications should be considered relative in that a patient with one of these factors may still be treated with chronic opioids with a good outcome. Nevertheless, doing so is more risky and certainly must be done with greater caution and attention to detail.

Those with a prior history of addictive behaviors, such as dependency on cigarettes, alcohol or street drugs, are certainly at greater risk for problems with chronic opioids. Severe character pathology, and particularly having a chaotic family/social environment, would predict a significantly higher risk of problems with long-term opioid use. Finally, some have felt that idiopathic pain is a relative contraindication to opioid use because the physician should have some sense of the organic basis of the problem being treated before using opioids. However, in recent years, the wisdom of this prohibition has been questioned since no one doubts that there are pain entities that are simply beyond our understanding and yet may be quite real. Presently many would view idiopathic pain as a reason for great caution but not as an absolute contraindication to using long-term opioids.

How Much Opioid?

Opioid use in cancer pain is well accepted because of the patient's expected early demise. As mentioned, many of these patients may live a long time with long-term opioids without difficulties. The approach used in such patients is to escalate the opioid dose until successful pain relief or until failure (inadequate analgesia or intolerable side effects). Portenoy, et al. (18), stated, "The absolute dose required in exploring these endpoints is immaterial." Portenoy also indicates that with caution, this approach can be reasonable for nonmalignant pain as well.

In nonmalignant pain, the chief goal for opioid use has been restoration of function: improved activities of daily living, return to work, psychological stabilization, improved family and social interactions, and decreased use of healthcare resources. More recently a small but growing number of pain experts propose that simply providing comfort, although it is totally subjective, is adequate reason to cautiously use long-term opioids. The basic goal in giving opioids should be to expand and enrich the patient's life (reduce pain, increase function). In the addict, life narrows and focuses only on the drug, resulting in decreased function. It is crucial to have these goals in mind when using long-term opioids in either cancer or non-cancer patients. We must recognize that these medications may make the patient better and help them achieve these goals, but certainly opioids may make some patients worse. Careful monitoring over time and discussion with the patient's significant other is important to help identify any deterioration in function.

Figure 1

Aberrant Drug-related Behaviors

Probably More Predictive of Addiction / Diversion:

- Selling prescription drugs
- Prescription forgery
- Stealing or "borrowing" drugs from others
- Injecting oral formulations
- Obtaining prescription drugs from nonmedical sources
- Concurrent abuse of alcohol or illicit drugs
- Multiple dose escalations or other noncompliance with therapy despite warnings
- Multiple episodes of prescription "loss"
- Repeatedly seeking prescription from other clinicians or from emergency rooms without informing prescriber or after warnings to desist
- Evidence of deterioration in ability to function at work, in the family, or socially that appear to be related to drug use
- Repeated resistance to changes in therapy despite clear evidence of adverse physical or psychological effects from the drug

Figure 2

Aberrant Drug-Related Behaviors

Probably Less Predictive of Addiction:

- Aggressive complaining about the need for more drug
- Drug hoarding during periods of reduced symptoms
- Requesting specific drugs
- Openly acquiring similar drugs from other medical sources
- Unsanctioned dose escalation or other noncompliance with therapy on one or two occasions
- Unapproved use of the drug to treat another symptom
- Reporting psychic effects not intended by the clinician
- Resistance to a change in therapy associated with "tolerable" adverse effects with expressions of anxiety related to the return of severe symptoms

Aberrant Drug-Related Behaviors

Certain patient behaviors (fig 1) lead to the definite diagnosis of addiction in chronic pain patients. Selling prescription drugs, forging prescriptions, injecting oral medications, and concurrent abuse of alcohol or illicit drugs are examples of strong signs of addiction. Less clear-cut in predicting addiction are behaviors (fig 2) that are common in the clinician's office: Urgent requests for more drug, drug hoarding, requesting specific drugs, and concern about changing the current therapy. These behaviors may signal either drug abuse or undertreated pain (19).

When aberrant behavior does occur, the physician must carefully assess whether it is truly addiction behavior or is less serious. If it is less serious, the physician might simply tighten up the pain management program. A written, signed contract is worthwhile for all patients receiving long-term opioids. If patient misbehavior occurs, the physician might carefully review the written contract with the patient. Frequent visits and smaller prescriptions might be required. Family involvement should already exist and might be increased. Random urine drug screens might play a role. If the aberrant behavior is more serious and indicates addiction, a specialist in addiction medicine should be consulted. This physician will

evaluate and then, if indicated, proceed with detoxification and intensive followup therapy.

Pseudoaddiction

Some of the behaviors listed above as less predictive of addiction may simply represent "aberrant behavior" in the setting of undertreated pain. In other words, if any reasonable person had bonafide severe pain and was having difficulty convincing the physician to treat it adequately, the patient would be alert to find ways to ameliorate their suffering. This would not represent psychopathology but adaptive behavior. This would be appropriate "drug seeking." Therefore, the physician must continually evaluate such behavior to determine if it represents the patient's loss of control with the drug and is maladaptive, or if it represents coping, adaptive behavior. Similarly, the term "pain behavior" has assumed a pejorative connotation. It must be remembered that the most common reason for pain behavior and of drug seeking (of analgesics) is not psychosocial pathology but simply the presence of pain.

Guidelines: Chronic Opioid Therapy

A few years ago there were no published guide-

lines for use of chronic opioids because it was widely believed that there was no place in good medicine for this practice. Now, however, many states, including Alaska, have developed guidelines (fig. 3) for using long-term opioids for chronic pain, whether malignant or nonmalignant. These are of great value and can help improve quality of care and avoid legal/administrative problems. In addition, the American Academy of Pain Medicine and the American Pain Society released a consensus statement (20) earlier this year recognizing the potential of imprudent use of opioids (for drug abuse and diversion) and describing guidelines for judicious use of the drugs in medical practice. For more detailed guidelines, see Portenoy (21).

By far the most frequent problems encountered when physicians prescribe opioids is poor record keeping to document the clinical indications, risk factors, the fact that other modalities have been tried and failed, and especially, poor documentation of prescription refills and patient response. Every visit should address: 1) comfort, 2) side effects, 3) functional status, and 4) any aberrant drug-related behaviors. Having the patient sign a contract for opioid use (fig. 4) helps both physician and patient to establish and follow correct behaviors. Another leading cause of prescribing problems is writing prescriptions for large quantities and refilling earlier than expected without a reasonable explanation. Some patients with

Figure 3

**State Medical Board
State of Alaska
Division of Occupational Licensing
3601 C Street Suite 722
Anchorage, Alaska 99503**

Guidelines for Prescribing Controlled Substances

1. Perform a workup sufficient to support a diagnosis, including all necessary tests.
2. Document a treatment plan that includes the use of nonaddictive modalities, and make referrals to specialists within the profession when indicated.
3. Document by history or clinical trial that nonaddictive modalities are not appropriate or are ineffective.
4. Identify drug-seeking patients. Review your records. If the patient is new, discuss drug and chemical use and family chemical history with the patient. If drug abuse is suspected, consider obtaining a chemical dependency evaluation or contacting local pharmacies.
5. Obtain informed consent of the patient before using a drug with the potential to cause dependency. Drug companies, the AMA, and other outlets provide printed material in layman's terms that can be used for patient education.
6. Monitor the patient. It is important to follow the patient for the primary condition that necessitates the drug, and for side effects of the drug, as well as the results of the drug. Drug holidays to evaluate for symptom recurrence or withdrawal are important.
7. Control the supply of the drug. Keep detailed records of the type, dose, and amount of the drug prescribed. Monitor, record, and control refills. Require the patient to return to obtain refill authorization at least part of the time. Records of cumulative dosage and average daily dosage are valuable.
8. Maintain contact with the patient's family as an objective source of information on the patient's response and compliance to the therapy.
9. Create an adequate record of care.

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Figure 4

NARCOTIC USE FOR CHRONIC PAIN

1. Diagnosis/Medical indication:
2. Functional goals (home, work, recreation):
3. Treatment plan (and measurable objective):
4. Informed Consent:
 - Addiction Potential
 - Adverse Reactions
 - Side Effects (depression, increased pain, decreased mental ability)

Alternatives:
5. Only the physician/office below will prescribe narcotics for you. You must notify this office if you are prescribed narcotics elsewhere (family doctor, dentist, ER, etc.).
6. Refill Policy:
 - A. Daily dose may / may not vary. The weekly / monthly dose must remain constant.
 - B. No refills will be made early (before the end of the week or month, etc.).
 - C. No refills will be done on Fridays or weekends.
 - D. No refills will be done by physicians out of this office.
 - E. Lost medications will not be a reason to refill meds early.
7. Periodic review will check for response, compliance, and toxicity/adverse effects. Random urine or blood samples may be taken for drug analysis.
8. I have/have not had medical or legal drug problems such as:

Alcoholism	Addiction	Drug Abuse	Drug Trafficking
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9. Second Opinion:
10. You have my permission to discuss my medical problem with my spouse or significant other,
-----.
11. Any failure to comply with the guidelines on this page and on prescription labels, obtaining narcotics elsewhere (even from physicians), any sharing of narcotics with others, any alteration of a prescription by a patient and/or any falsehood on #7 above, will require termination of this narcotic use program and of our doctor-patient relationship.

I HAVE READ THIS FORM ON "NARCOTIC USE FOR CHRONIC PAIN." I UNDERSTAND AND AGREE TO THE POLICY. All questions have been answered to my satisfaction.

Patient's Signature

Date

Physician's Signature

* Based on recommendations of California Medical Association and California State Bureau of Quality Assurance, modified by Morris R. Horning, M.D.

narcuse frm Updated 6/97

a history of addiction behaviors will need to be seen weekly at first to establish a record of good behavior. Then the visits may be prolonged to every two weeks, then every month if behavior is solid. This also lets the physician catch little misbehaviors before they get out of control, correct the problem if appropriate, and help the patient become successful. The usual patient without behavioral risk factors can be followed at three or four weeks initially and then less often as time goes by.

A major error in managing chronic pain is failure to recognize the psychosocial and cognitive/emotional basis of at least part of almost every pain patient's problem. Treating these neglected aspects of the pain picture with opioids, injections, surgery, and other treatments directed toward only the nociceptive aspect of pain will be expensive while leading to failure and frustration for all involved. In contrast, treating psychosocial issues appropriately will often reduce the need for analgesics.

A summary of the most important guidelines in using chronic opioids would be: (1) monitor and document, (2) monitor and document, and (3) monitor and document. The Alaska State Professional Regulations for physicians (fig 5), although somewhat meager, seem to confirm this and imply that adhering to these regulations will avoid regulatory conflicts.

Figure 5

Alaska State Professional Regulations

12 AAC 40.975. PRESCRIBING CONTROLLED SUBSTANCES. When prescribing a drug that is a controlled substance, as defined in AS 11.71.900, an individual licensed under this chapter shall create and maintain a complete, clear, and legible written record of care that includes, at a minimum,

- (1) a patient history and evaluation sufficient to support a diagnosis;
- (2) a diagnosis and treatment plan for the diagnosis;
- (3) monitoring the patient for the primary condition that necessitates the drug, side effects of the drug, and results of the drug, as appropriate;
- (4) a record of drugs prescribed, administered, or dispensed, including the type of drug, dose, and any authorized refills.

Conclusion

Many physicians will object that using long-term opioids will make their practice and their lives much more stressed and unhappy. The experience of pain specialists is the opposite. Giving appropriate pain relief will make the majority of patients become more compliant and less demanding and manipulative. Following a set of guidelines, known to the patient in advance, makes the behavioral issues more clear-cut so that the physician can practice medicine rather than being a policeman. Some patients will still need a pain specialist. Many, however, may be treated quite well by their family physician, perhaps with occasional consultation by a pain physician.

The final word on long-term use of opioids has not been written. There is exciting new work from the laboratory on opioid receptor research as well as clinical research with better controls than in the past. We have long known that opioids are disastrous for some patients. It is now becoming clear, and widely recognized, that some patients can do well and greatly benefit with long-term opioids. Sorting out which patients will benefit and carefully managing their opioid use can be demanding and yet rewarding for the physician and provides an important tool to relieve suffering for a majority of selected patients.

"We must all die. But that I can save him from days of torture, that is what I feel as my great and ever new privilege. Pain is a more terrible lord of mankind than even death himself." Albert Schweitzer (22).

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(continued on page 120)

THE NEXT CHALLENGE FOR NEWBORN INTENSIVE CARE IN ALASKA: IMPROVING THE SURVIVAL OF THE LARGER NEONATE

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ABSTRACT

Using information from our database, a review of mortality for the Newborn Intensive Care Unit at Providence Alaska Medical Center was conducted for 1987-1996.

There has been a significant decline in mortality over the last decade ($p=0.003$). An analysis of mortality by birthweight and gestational age groups demonstrated a decline in mortality ($p=0.005$) for infants with birthweight <2 kg and infants ≤ 34 weeks gestation, but no change for infants ≥ 2 kg and ≥ 35 weeks gestation. As a result, larger and more mature babies now account for an increasing proportion of NICU deaths. For 1995 and 1996 the major contributors to mortality for the smaller neonates were respiratory distress syndrome and congenital and nosocomial sepsis/pneumonia. The major contributors to mortality for larger neonates were persistent pulmonary hypertension of the newborn, congenital heart disease, congenital diaphragmatic hernia, and primary birth asphyxia. A majority of deaths in the larger neonates were due to non-lethal causes.

We contend that improved survival in the larger neonate is an important and achievable goal. The introduction of ECMO (Extracorporeal Membrane Oxygenation) for the NICU and a focused review of the neonatal cardiac program offers the best possible potential for achieving this goal.

Since 1987 Alaska Neonatology Associates has maintained a database for all patients admitted to the Newborn Intensive Care Unit (NICU) at Providence Alaska Medical Center (PAMC). A portion of this database is focused on mortality. This manuscript examines issues relating to the changing pattern in mortality within the NICU, with a focus on ways to improve survival.

Analyses of mortality and morbidity have been important in the past in providing a direction for improving care and for the introduction of new therapies or programs (1,2,3). This analysis also provides perinatal health care providers with current information on survival in certain high-risk populations, such as the very low birthweight infant, and thereby allows for informed decision making.

Method

The database includes medical, demographic, and socioeconomic information. From 1987-1990, the database contained maternal and newborn admission information. In 1991 the database was expanded to include discharge data, consisting primarily of information related to patient diagnoses. One of the important features of the database is the use of definitions for each field of data in order to maintain consistency and maximize interobserver reliability. Maintenance of the database is limited to two people with medical backgrounds.

Mortality figures were based on the year of birth of the infant. Infants were considered a NICU death if they spent their entire life after admission to the NICU hospitalized. In some circumstances the death may have occurred in a hospital setting other than the NICU (ie: transfer for cardiac surgery).

A primary cause of death was assigned for all deaths occurring in birthyears 1995 and 1996.

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Specific medical diagnoses were assigned as a cause of death if the condition directly contributed to a sequence of events leading to death. Prematurity was not assigned as a primary cause of death. Standard definitions were used for defining congenital anomalies (4). Major anomalies are those that affect survival, require substantial medical care, or result in marked physiological or psychological impairment (5).

The following definitions were used in assigning the preventability of a death. Lethal (or non-preventable) conditions were those for which no standard therapy exists. Heroic or experimental therapies were not considered standard and were excluded. In order for a condition to be considered preventable it should have a survival rate of $\geq 50\%$ in the medical literature from multiple centers. Conditions with a grim prognosis, where non-intervention or withdrawal of life support was deemed appropriate, were also defined as lethal. In order for babies to be considered viable at the lower limits of gestation, the survival at the PAMC needed to be $\geq 50\%$ for two consecutive years. Using this criteria, babies ≥ 24 weeks gestation were considered viable.

All analyses were done using the SPSS program Version 7.5 (6). Linear models were used to assess the independent effect of time on mortality for the various groups. An alpha level of 0.05 was used for all statistical tests.

Results

Figure 1 shows the number of admissions and deaths in the NICU from 1987 to 1996. The number of babies admitted to the NICU has not changed over the last 10 years, while the number of deaths have declined significantly ($p = 0.003$). Figures 2 and 3 shows the changes in mortality by birthweight and gestational age groups. Over the last 10 years there has been a significant decline in mortality rates for infants with birthweights < 2 kg ($p = 0.005$) and for infants ≤ 34 weeks gestation ($p = 0.001$). Mortality rates for infants ≥ 2 kg and for infants ≥ 35 weeks gestation have not changed. As a result, larger and more mature babies now account for an increasing proportion of NICU deaths at PAMC. In 1987 infants weighing ≥ 2 kg accounted for 29% of all NICU deaths; by 1996 these infants accounted for 50% of all deaths. Similarly, the percentage of NICU deaths occurring in infants ≥ 35 weeks gestation increased from 24% in 1987 to 44% in 1996 ($p = 0.007$). A similar analysis of term neonates (≥ 38 weeks gestation) admitted to the NICU shows this group also contributed an increasing proportion of NICU deaths (17% in 1987 and 31% in 1996) ($p =$

0.05). Figure 4 shows changes in mortality for babies born at very early gestation (23 - 28 weeks). There has been a significant decrease ($p = 0.02$) in mortality over time.

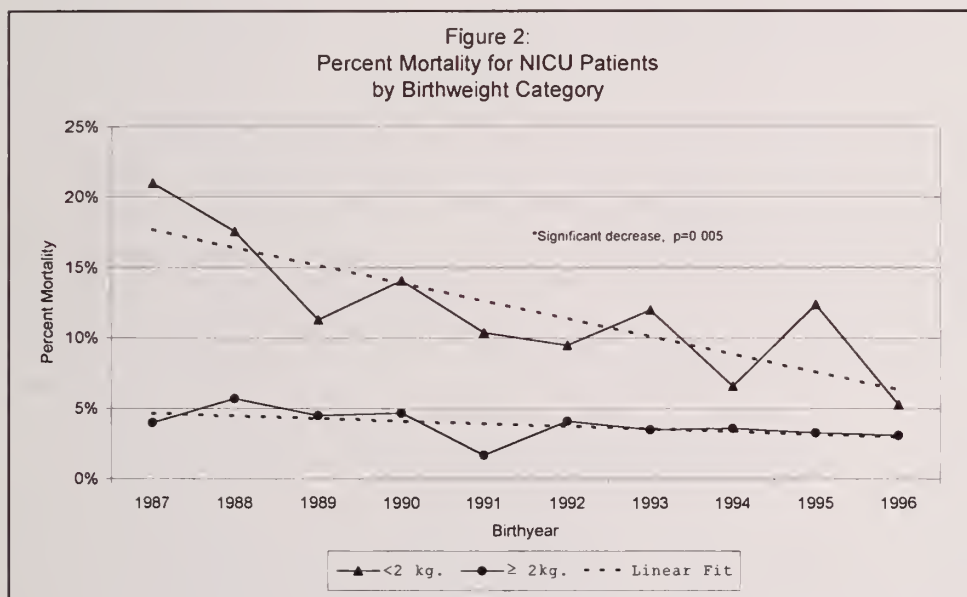
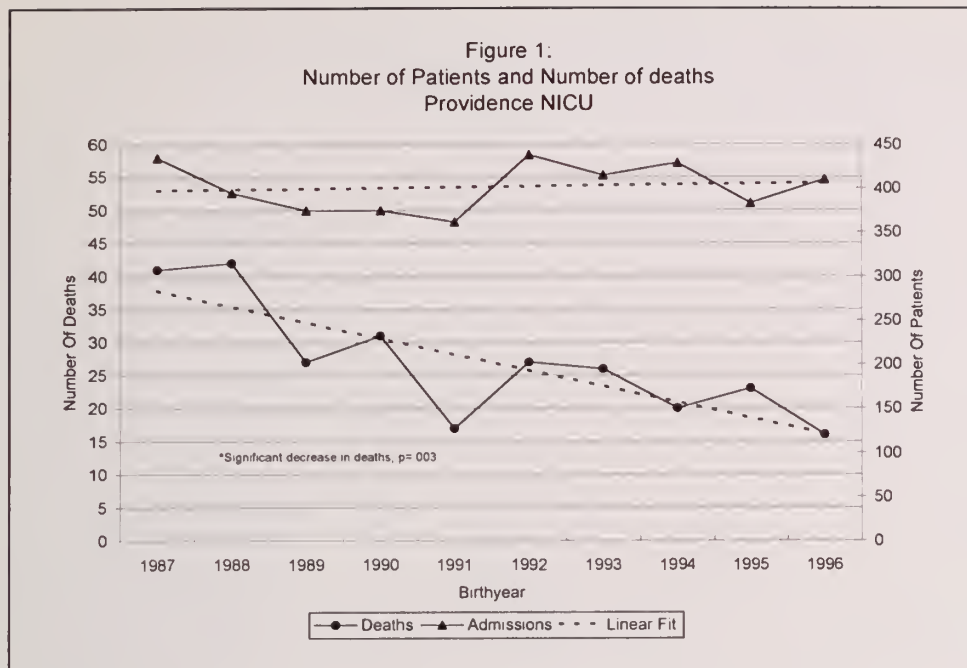
Major congenital anomalies are a frequent contributor to morbidity and mortality in the newborn. Figure 5 shows the percentage of deaths from 1991 to 1996 associated with major congenital anomalies. Anomalies are associated with a significant number of deaths and have not changed over time. Congenital anomalies were associated with 17% of deaths in babies < 2 kg birthweight and 60% of deaths in babies ≥ 2 kg. Similarly, major congenital anomalies were associated with 17% of deaths in babies ≤ 34 weeks, and 61% of deaths in babies ≥ 35 weeks gestation.

A detailed analysis of all deaths ($n=39$) was conducted for 1995 and 1996. Thirty-three of the deaths occurred in the neonatal period, five in the post-neonatal period, and one after one year of age. Males accounted for 59% of admissions and 72% of deaths. The racial distribution of deaths was as follows: Caucasian 54%, Alaska Native or American Indian 33%, Asian 5%, Latino 2.5%, and African-American 2.5%.

Major causes of death are shown in Table 1. Major congenital anomalies played a direct role in the sequence of events resulting in death (31% of deaths, $n=12$). These occurred at both upper and lower gestational age and birthweight categories. Of these, five cases were considered lethal, and 7 non-lethal. Table 2 lists the diagnoses involved. Congenital heart disease accounted for 13% of all deaths ($n=5$), and 42% of deaths due to congenital anomalies. Congenital diaphragmatic hernia accounted for 8% of all deaths and 25% of deaths due to congenital anomalies.

Another major cause of death was severe respiratory distress syndrome with progressive acute or chronic respiratory failure ($n=11$, 28% of deaths). Gestational ages of these infants varied from 23 - 32 weeks; most of the cases were ≤ 26 weeks. Since 1987 there has been a decline in this category as a cause of death. Other major contributors to mortality were persistent pulmonary hypertension (either primary or associated with congenital diaphragmatic hernia) 15%, sepsis/pneumonia 15%, and primary perinatal asphyxia 10%. Nosocomial sepsis accounted for half of the cases of sepsis; Group B Streptococcal (GBS) sepsis/pneumonia accounted for all the cases of congenital infection.

Twenty-six percent of deaths were considered to be non-viable. These consisted of non-viable prematurity (4 cases), lethal congenital anomalies (5 cases), and severe pulmonary hypoplasia associated with fetal hydrops (1 case).



Discussion

Results from the NICU at Providence Alaska Medical Center for the last decade demonstrate a steady and significant decline in mortality. This coincides with the simultaneous decline in neonatal mortality in Alaska from 5.3 per 1000 live births in 1987 (7) to 4.7 per 1000 live births in 1995 (8), the most recent year for which statewide statistics are available. Our data shows that the primary beneficiary of this improvement in outcome is the premature infant. Surfactant replacement therapy for respiratory distress syndrome has undoubtedly played a major role

in this improvement (9). Our data shows that mortality for the very immature preterm infant began declining in 1989 (figure 4), the year surfactant therapy was introduced in the NICU at PAMC under experimental protocol. The widespread use of surfactant in the NICU did not occur until 1991, when the FDA approved its use. Although difficult to quantify, other factors are also likely to have contributed to this decline. These include improved obstetric attitudes toward the extremely premature infant, increased use of antenatal corticosteroid therapy for the acceleration of lung maturity (10), initiation of perinatology as a subspecialty in Alaska, general improvement in the supportive care of the extremely premature infant, technological advances such as the introduction of high frequency ventilation (11), and a supportive attitude of many perinatal practitioners and health care administrators toward the

regionalization of high risk perinatal care (12). The latter is especially important in an era where increasing competition between institutions and restrictions placed by managed care are eroding the gains made from the regionalization of perinatal care.

Our analysis showed that the greatest contributors to mortality in the premature infant ≤ 34 weeks gestation was severe pulmonary disease (48%) and congenital/nosocomial sepsis (22%). Severe pulmonary disease due to respiratory distress syndrome has been the one area where the greatest progress has been made in neonatal medicine through the introduction of surfactant therapy (9). Nevertheless,

Figure 3:
Percent Mortality for NICU Patients
by Gestational Age Category

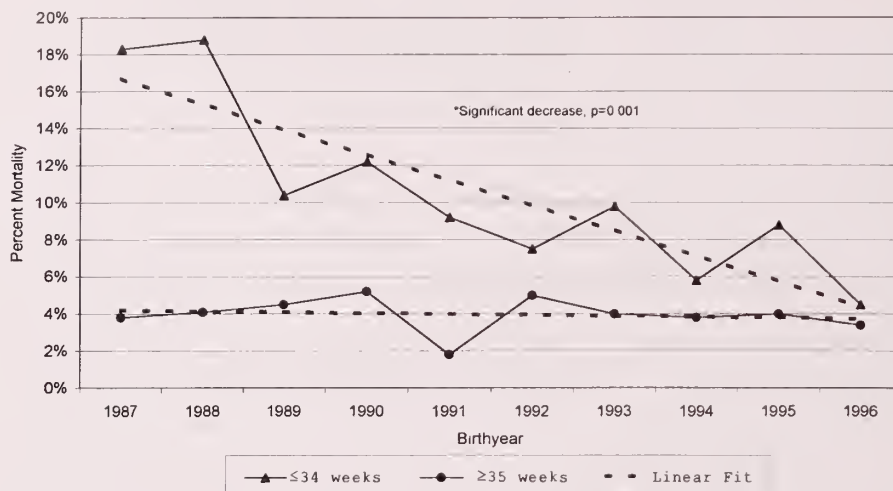
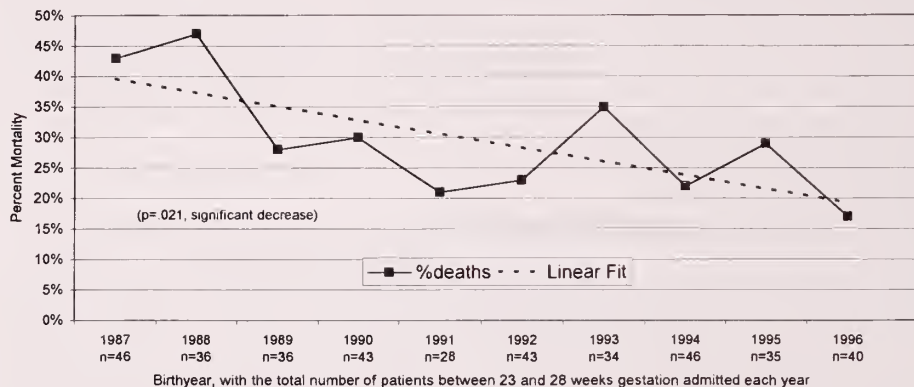


Figure 4:
Percent Mortality, 23-28 weeks Gestation
Providence NICU



due to its frequency of occurrence, it is the area that has the greatest potential for further reduction in mortality for this population. Previous experience from our NICU concluded that improving the survival and morbidity of the extremely low birthweight baby, many of whom die of severe pulmonary disease, requires us to optimize fetal care in complicated pregnancies at 20-25 weeks gestation (3). It is in this area that improved obstetric attitudes toward the extremely premature infant and a supportive attitude toward regionalization of perinatal care can have an impact on outcomes. In addition, newer therapies such as partial liquid ventilation (13), that are in early experimental phases, hold hope that further progress is possible in this area. Partial liquid ventilation is a rapidly evolving area of research in neonatal medicine. It is likely that if further studies in neonates

demonstrate improved survival and less respiratory morbidity, Alaska Neonatology Associates will undertake the experimental introduction of this therapy in the NICU.

Nosocomial sepsis is an unresolved problem for newborn intensive care. The National Institute of Child Health and Human Development Neonatal Research Network has identified this as a major source of mortality and morbidity in the tiny premature infant (14). Unfortunately, a compromised immune system (15), combined with the need for prolonged invasive therapy, make therapeutic options limited. Nevertheless, there is ongoing research on best practices in the NICU environment, looking at differences between units and clinical practices which may help in decreasing the incidence of this complication.

A review of the cases of congenital sepsis/pneumonia due to Group B Streptococcus showed

that none of the deaths could have been prevented with currently recommended strategies (16). This emphasizes the fact that the present approaches to the prevention of GBS disease in the neonate will not prevent all cases.

It is remarkable that we have been unable to effect any improvement in mortality for the infant ≥ 35 weeks gestation or ≥ 2 kg birthweight infant in the last decade. Clearly the task of reducing mortality in a group of infants with a low mortality rate is more difficult. However, during this period there have been advances in the care of the larger and more mature sick neonate. We have developed a greater understanding of the pathophysiology and treatment of persistent pulmonary hypertension of the newborn, developed high frequency ventilation for treating

Figure 5:
Percent of Deaths Associated with Major Congenital Anomalies,
NICU Patients, Birthyears 1991-1996

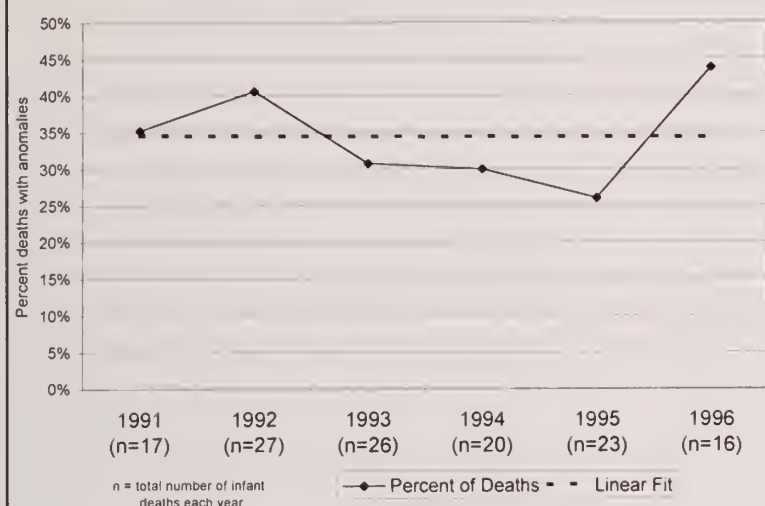


TABLE 1

MAJOR CAUSES OF DEATH 1995-1996

Major Congenital anomalies (31%)
Severe Respiratory Distress Syndrome (28%)
Persistent Pulmonary Hypertension of the Newborn (15%)
Sepsis/Pneumonia (15%)
Primary Perinatal Asphyxia (10%)

TABLE 2

LETHAL AND NON-LETHAL CONGENITAL ANOMALIES

LETHAL (n=5)	NON-LETHAL (n=7)
Smith-Limeli-Opitz Syndrome	Vaters Anomalad
Cerebral Dysgenesis	Congenital Diaphragmatic Hernia (3 patients)
Congenital Hypotonia	Transposition of the Great Vessels (2 patients)
Hypoplastic Left Heart Syndrome	Complex Congenital Heart Disease
Complex Congenital Heart Disease	

significant impact on mortality in the NICU for this group of infants.

The greatest contributors to mortality in the infant ≥ 35 weeks gestation is primary or secondary persistent pulmonary hypertension (38%), congenital heart disease (31%), congenital diaphragmatic hernia (19%), and primary perinatal asphyxia (19%). Congenital diaphragmatic hernia is almost always associated with persistent pulmonary hypertension and is frequently the cause of sudden deterioration and death. Therapies available for the treatment of this disease include general supportive medical measures, high frequency ventilation, prostaglandin therapy, inhaled nitric oxide, and Extracorporeal Membrane Oxygenation (ECMO). All these modes of therapy are available in Alaska except for ECMO. In the past ECMO

was not considered for the NICU because of the highly demanding nature of the procedure, the small number of patients who would benefit, the resources that would be expended, and the difficulty in maintaining the skills of the team. The approach taken has been to transport such infants to an ECMO center outside Alaska. Unfortunately, the experience in the NICU has been that these infants frequently deteriorate rapidly and are difficult to transport long distances. It is not unusual for 8 to 10 hours to elapse from the time of decision to send a baby for ECMO to the time a baby is started on ECMO. Thus, it is not

surprising that deaths have occurred prior to and during transport. From this analysis it is apparent that the availability of ECMO in Alaska has the potential of making an impact on the mortality of the larger and more mature newborn. In addition, a review of infants who died with congenital

neonates with severe pulmonary disease, developed a more aggressive approach toward the correction of life-threatening congenital heart disease, and introduced more effective strategies for the treatment of meconium aspiration syndrome. In addition, inhaled nitric oxide therapy for the treatment of persistent pulmonary hypertension was introduced in the NICU in 1996 under an experimental protocol. It is too early to determine its impact in the NICU on mortality in larger infants. Except for the latter, it is clear that none of the advances in neonatal care have had a

heart disease suggests that some of them may also have benefited from ECMO. Based on this analysis we are investigating the potential of introducing ECMO in the NICU as a way to further improve neonatal mortality.

Another diagnostic category for potential improvement is congenital heart disease. Most cases of life threatening congenital heart disease diagnosed in the neonatal period are transported out of state for definitive or palliative surgery. Of the 5 cases that died, two had lethal defects. Two infants with transposition of the great vessels, a potentially non-lethal

heart defect, died. An additional infant with complex heart disease, which included transposition of the great vessels, also died. Underlying factors leading to death for infants with congenital heart disease included lethal lesions, rapid hypoxia and acidosis after birth, sudden post-operative death, severe chronic lung disease, and a procedural complication. In addition to mortality, congenital heart disease accounted for 60% (3 of 5 cases) of severe ventilator-dependent chronic lung disease in the NICU for 1995-1996. Based on this experience it is appropriate to reevaluate our program and referral patterns for infants with congenital heart disease in order to determine whether improvements can be made in this high-risk population.

A final area for potential improvement in the larger and more mature neonate is primary birth asphyxia. In 75% (3 of 4 cases) of the cases of primary birth asphyxia there was severe fetal distress associated with placental abruption at the time of maternal presentation at the hospital with prompt surgical intervention to deliver the baby. Therefore, medical preventative strategies are limited.

The fact that infants ≥ 2 kg now account for 50% of NICU deaths and infants ≥ 35 weeks gestation account for 44% of NICU deaths, coupled with the lack of effecting a change in mortality, makes it important to focus on ways to improve these results. Since a majority of deaths in infant ≥ 2 kg and ≥ 35 weeks gestation are non-lethal, we contend that improved survival in this population is an achievable goal.

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Alaska Awarded Foundation Grants to Strengthen Public Health System

In a day-long media briefing held yesterday in New York City, the Robert Wood Johnson and W.K. Kellogg Foundations announced that Alaska is one of 14 states to be awarded grants to strengthen the public health system. The foundations' joint initiative, *Turning Point: Collaborating for a New Century in Public Health*, provides financial and technical support for both state and community level partnerships working together to identify and implement changes needed to improve the public health infrastructure.

"Public health activities such as screening for infectious disease, providing immunizations, and assuring safe food and clean drinking water, are primarily responsible for improved health," said Dr. Peter Nakamura, Director of Alaska's Division of Public Health. "Nationally, Americans are living an average of 30 years longer than we were at the turn of the century. Of this 30 year increase, 25 years are due to public health interventions."

The Alaska Division of Public Health will be awarded a *Turning Point* grant for conducting a statewide collaborative effort to study the current public health system, recommend changes for strengthening the system, and develop strategies for implementing those changes.

The communities of Sitka, Fairbanks, and the Central Kenai Peninsula will also be awarded *Turning Point* grants to develop public health part-

nerships at the grassroots level. These community partnerships will work together with the statewide coalition to analyze needed changes concerning the roles of and relationships among the various public and private agencies and institutions involved in the public health system.

"This grant opportunity comes at a fortuitous time," said Governor Tony Knowles. "With the many changes occurring today in health care and environmental protection, it is important that Alaskans work together to develop a new public health system for our state; one that is equipped to meet the challenge to protect and improve the health of Alaskan families and communities in the 21st century."

The national grant award announcement was made, coincidentally, as Alaskans from across the state working in the health arena convened in Anchorage for the beginning of the annual Alaska Health Summit. This conference, which is being held at the Hilton Hotel December 3rd through the 5th, includes a series of sessions devoted to Alaska's Public Health Improvement Process. These sessions will be kicked-off with a policy leader panel including Senator Jim Duncan, Representative Con Bunde, Department of Health & Social Services Commissioner Karen Perdue, Department of Environmental Conservation Deputy Commissioner Al Ewing, and Director of the Municipality of Anchorage Department of Health & Human Services, Elaine Christian.

Grant Awards:

\$300,000 to State Division of Public Health for statewide process (2 year grant)

\$ 60,000 to each community for local process (3 year grant)

Editorial. . .

This edition of Alaska Medicine comes with an exchange of eras in our State. We wish to congratulate our passing editor-in-chief Dr. Don Rogers for all the past nine years of uncompromising service to the Journal and our society, and to the continuation of a publication of excellence—a source of pride for us all.

We will miss him, but wish both he and Georgia all our best as they head into new adventures. I look forward to his sage council as editor emeritus.

I am honored to take over as Editor of Alaska Medicine at this time of profound challenge to the present practice of medicine in our State. We are on the border of exciting new professional and academic experiments with the extension of our WAMI association, and the addition of our own in-state residency program. Guidance and direction will be required by all to achieve mutually beneficial relationships.

Managed care creeps ever closer to our doorstep as does a whole host of outside challenges to our present business-as-usual environment. We will absolutely have to answer these challenges. An example is an article which all should peruse regarding the shortage of physicians in Alaska, as perceived by a state of Washington analysis appearing in the November issue of the Western Journal of Medicine. The JAMA article dated 3 December 1997 has included two articles, as well as, an editorial commentary on the alcohol control experiments in our state and their potential ramifications for public health policy in the Lower 48. These certainly demonstrate to us our importance, and of the interest generated by our medical community nationally!

I hope to be able to address these and similar issues and would like to make a shift back to a more clinical emphasis in our Journal. For this first issue, I have selected excellent and extremely timely articles impacting active and immediate public health and safety issues. The first relates to youth and driving statistics in our state and obvious implications for continuing efforts to achieve safer road conditions for us all. The clinically controversial use of chronic opiate administration in management of multiple medical syndromes and establishment of practical physician standards effects a vast audience of Alaska's practitioners, and baseline parameters are succinctly drawn out by Horning, et al.

Finally, the need to establish clinical outcomes-based studies defining the progress and shortcomings in our practices is pointedly demonstrated by Jacobs, et al with positive solutions given in their concluding comments. I see great potential to push the standards of excellence we have come to expect from our Alaskan medical community even higher!

I would solicit you to help us continue our great tradition by contributing in the way of scientific and review articles as well as case reports of note. I am committed to be responsive in obtaining peer review on a timely basis and will make a turnaround time from receipt to acceptance or rejection of 3 weeks as my goal. I look forward to your contributions as we head into the new millenium together. Please don't hesitate to give suggestions to myself or any of our eager and dedicated editorial Board members for further improvements in our Journal. I look forward to serving you, and we at the Journal wish you all Happy Holidays and a wonderful New Year.

William R. Clark, MD
Editor

A Note from Donald R. Rogers, MD Retired Editor

While serving as editor of Alaska Medicine for these past seven years has been personally rewarding, challenging, and just plain fun, one cannot continue forever. Fortunately, Dr. Bill Clark volunteered to succeed me. I think this happened as he was squeezing my prostate a few weeks ago, and perhaps he intended to make up for the immediate pain in some small way. In any case, whatever his motive, I appreciate his assumption of the attendant duties.

We continue to suffer a shortage of original articles. Surely there is enough going on in our profession to fill our small journal. Remember—we are indexed—your articles will receive global recognition.

Thank you for your support and encouragement!

Donald R. Rogers, MD
Editor, retired

Letter to the Editor. . .

Rickets Among Breast-fed Infants in Alaska

Dear Editor:

The article in the last issue of *Alaska Medicine*, "Nutritional Rickets Among Breast-fed Infants" reported by Gessner et al (1) prompts me to report an additional recent case, presenting as hypocalcemic seizures.

Case Report

J.S. was a 7-month-old Alaska Native male who presented in early March, 1997 to the Bartlett Regional Hospital emergency department with "troubled breathing" followed by a seizure. Approximately two minutes of tonic-clonic generalized movements with upward eye deviation was followed by post ictal drowsiness. Earlier in the day there had been a similar episode of "troubled breathing" and "twitching" but without frank seizures and not as alarming to the parents.

Examination revealed an apparently well nourished, large for age (8.5 kg) afebrile Tlinigit Indian baby who was irritable. CSF studies were normal. Scout films of the abdomen, chest and skull revealed no evidence of aspiration, pneumonia, foreign body or occult skull fracture.

There was no rachitic rosary, wrist thickening, tenderness or significant frontal bossing.

Lab studies revealed: normal serum glucose (90), high alkaline phosphatase 939 (reference value 145 - 320), albumin 4 gms, normal phosphorous 4.5, and low calcium of 6.3 (R.V. 8.9 - 9.8).

Differential diagnoses included Vitamin D resistant and Vitamin D deficient rickets. Samples were taken for parathyroid hormone level, 25 - OH Vitamin D and 125 - OH Vitamin D levels, and the patient started on p.o. calcitrol (Rocaltriol) and calcium gluconate.

The serum Vitamin D 25 - OH was reported very low, less than 5 ng/ml (R.V. 8 - 21). Parathyroid hormone was 158 (R.V. 11-54). The baby was transferred to Children's Hospital Medical Center in Seattle where the diagnosis of Vitamin D deficient rickets was confirmed. Dietary history was further obtained that he was entirely breast-fed except recent cereal and fruit feedings. The patient's mother had a history of lactose intolerance; she did not drink milk or take significant dairy products and did not take vitamins. Her calcium was low (8.6), her phosphate 2.6. Both mother and baby were discharged home on Vitamin D supplements, have recovered normal chemistries and are doing well clinically.

Discussion

The five cases, 1993 - 96, discussed in *Alaska Medicine* (1) reflect other reports in the literature. (2,3,5) The Canadian literature, especially, has addressed the need for Vitamin D supplementation in northern latitudes (3).

Sunlight exposure and Vitamin D synthesis varies by latitude, external temperatures and length of sun exposure (5). This case is complicated by reduced maternal Vitamin D and calcium intake. The maternal intake of Vitamin D necessary to insure prevention of infant rickets may be high (4).

The "fight against rickets" is old. A connection between rickets and Vitamin D lack was made shortly after World War I. A link between rickets and sunlight and its prevention by cod liver oil was made then.

Rickets is now rare, but *does* occur in northern climates. Are there subclinical cases? Bowed legs, decreased height, undocumented hypocalcemia? (Note, the present case, as well as others, (1) did not present with classical rachitic rosary or metaphyseal findings).

Comment

Establishing Vitamin D dietary requirements is difficult because of sunlight synthesis in the skin. The United States RDA has been set at 400 I.U./day, the amount added per quart of milk in this country. The Canadian RDA has been similar (though expressed there as ug/d. of cholecalciferol, 1 ug = 40 I.U. of cholecalciferol).

It seems an oversimplification to state nationwide RDA's for Vitamin D (and perhaps calcium?) regardless of latitude, seasonal temperatures and cloud cover. Southeast and northern Alaska and northern Canada are not in the "Sunbelt"—it's a lot different from Arizona, California and Florida. Interestingly, not even a most widely used pediatric textbook does not discuss this (7). Perhaps a review of Vitamin D requirements for pregnant and lactating women and breast-fed infants is warranted.

Conclusion

An additional case of rickets presenting as hypocalcemic seizures is described from Juneau, Alaska,

latitude 58 . Maternal decreased intake of Vitamin D and calcium was contributory. The writer agrees with Gessner et al (1) that breast-fed infants should receive Vitamin D supplements and have careful growth monitoring.

Kenneth W. Moss, M.D.
1600 Glacier Highway
Juneau, AK 99801

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From Out of the Past — Thirty Years Ago. . .

Gloria K. Parks, MD ⁽¹⁾

Historical Mileposts as reflected in the Alaska Medicine Muktuk Morsels of 1967

by Dr. Arndt von Hippel

CHICKEN: A letter from Dr. Aloys J. Daack, Chicken, Alaska, states that his general practice office is located "at the Biglow Mine, in the Heart of the Forty Mile, on Taylor Highway at Mile 69" (look carefully between Tok and Dawson).

NOME (DIARY): On Friday January 13th I flew to Nome for a 4 day weekend of general practice. Before departing I was briefed on Roseola, Rubella and "runny ears". After some mechanical difficulties (a malrotation of the propeller) the plane finally arrived at Nome.

Of the many medical problems I saw during my several days in Nome, I can say little, except that I arrived during an epidemic of G.C., tonsillitis, strep throat, otitis media and what-not; all of which I discovered are manifestations of the "penicillin-deficiency syndrome". The one patient with pulmonary edema we had did very well.

No medical report on Nome should ignore the town water and sewage systems. For any appreciation of these systems, consideration of the climate and permafrost are essential. Although some homes and hotels have piped in water from a nearby river, many homes get their water through the long winter by melting ice on the stove. Much of the town's sewage system is still "honeybucket".

After my tour in Nome had officially ended, another 36 hours went by while a modern turbo-prop airplane waited out an old fashioned blizzard, again emphasizing the medical isolation of this community and its physician.

FAIRBANKS: We understand that St. Joseph's Hospital in Fairbanks has obtained a stay of condemnation of one wing of the hospital by installation of a sprinkler system.

Dr. Henry Green, Fairbanks only anesthesiologist, is moving to Medera, California.

Lt. Colonel Edwin Lindig Jr., former commanding officer at Bassett Army Hospital, presently Chief Surgeon, U.S. Army Alaska, expects to retire and

join the Fairbanks Clinic in Orthopedics.

Major William F. Kinn, Chief of the Department of Surgery and Director of the Ophthalmology Service at Bassett Army Hospital plans to enter the private practice of ophthalmology in Fairbanks.

ANCHORAGE: The Presbyterian Hospital of Anchorage has been sold to Pioneer Associates, a Seattle-based hospital management and supply group, and renamed the Anchorage Community Hospital.

Dr. Karl Bowman, former director of the Division of Mental Health and Superintendent of the Alaska Psychiatric Institute has retired, for the third time, and returned to California.

Dr. John P. Rollins, Chief of Psychiatric Services at A.P.I. is acting superintendent pending the arrival of Dr. Carl D. Koutsky of Minnesota.

Dr. David Dietz will join the Doctors Clinic in July on completion of his surgical training at Stanford.

Dr. William Mills will return to Anchorage this summer after a year in Vietnam. He plans to take a one year appointment as Visiting Professor of Orthopedics at Vanderbilt Medical School in Nashville before reopening his private practice in Anchorage.

Dr. George Wichman survived the ordeals of winter mountaineering on the slopes of Mt. McKinley and can still count to 20 with his shoes off. One climber fell to his death on this first successful winter climb of Mt. McKinley.

Dr. Fred Strauss finally got his first son after four daughters.

Dr. Howard Romig had his 13th child, 7th daughter.

Drs. Marianne and Arndt von Hippel had their 3rd son, fourth child.

Eagle River will finally get a physician when Dr.

Thomas F. Green of Pittsburgh opens his office in general practice this summer.

KENAI: Dr. Robert Struthers left Kenai and returned to Oregon after one year in private practice.

Dr. O. H. Armstrong has opened an office in general practice in Kenai, but we understand that still another man is needed there. At present Dr. Paul Isaak and Dr. Elmer Gaede are spread rather thin between Kenai, Seldovia and Soldotna.

KODIAK: Dr. John Eufemio is returning to New York after one year because of family health problems. Until another general surgeon is found Dr. Mildred McMurtry, a general practitioner from Cleveland and Dr. R. Holmes Johnson will have an empty office in their beautiful new clinic building with the "million dollar view".

SITKA: Dr. George Longenbaugh, a Board certified general surgeon who has been in charge of the Department of Surgery at Mt. Edgecombe for a number of years, will retire from the U.S.P.H.S. this summer and enter private practice in association with Dr. Philip H. Moore.

The Heart Stroke and Cancer program is slowly progressing. So far the emphasis has been on data gathering. Two Alaskan proposals have been presented to the Heart Stroke and Cancer regional advisory group. These are now under evaluation. The first is an application for money for the purchase of a cobalt therapy unit to be housed next to Providence Hospital. A group affiliated with the American Cancer Society has been set up to raise necessary building funds. The other request is for financial assistance to a proposed area medical library facility now being organized at the Alaska Native Medical Center. This project was stimulated by the impending transfer of the Arctic Health Research Library facilities from Anchorage to Fairbanks.

PEKING: We have a subscription request from China for *Alaska Medicine* starting with the June issue.

NOME: Dr. Joseph O. Rude took care of Nome medical problems during the recent three week vacation of Dr. Harold Bartko.

FAIRBANKS: The Fairbanks Medical Society is still trying to find an anesthesiologist for St. Joseph's Hospital. Two new board eligible internists have joined the Fairbanks Medical and Surgical Clinic, Dr. Gary L. Walkup of Washington State and Dr. Glen W. Straatsma from Michigan.

Dr. Paul Stuck is now associated with the Daniel Boone Clinic in Harlan, Kentucky. Dr. Robert Taylor has been stationed in Vietnam by the Navy.

ANCHORAGE: Dr. William Mills has safely completed his one year in Vietnam with the Navy at DaNang.

Dr. George Hale got his private pilot's license. Dr. Charles St. John got his instrument rating.

SOLDOTNA: Dr. Elmer Gaede recently sustained compression fractures of L1 and L2 as well as face and neck injuries when he made a forced landing following a sudden engine failure.

The Peninsula General Hospital completion has been delayed by financial problems. Dr. Peter O. Hansen, formerly of Juneau, plans to open a Soldotna office in general practice in association with Dr. Paul Isaak and Dr. Elmer Gaede.

CORDOVA: Disaster struck the Packaged Disaster Hospital in Cordova recently when the city warehouse in which it was stored burned to the ground.

JUNEAU: With the death of Dr. Jack Gibson and the closing of the Juneau Clinic there has been a marked change in the medical scene here. In addition to the Soldotna move of Dr. Peter Hansen, Dr. Robert Smalley has moved his general surgery offices into St. Ann's Hospital. This leaves Drs. Akiyama, Dalton, Ray, and Reiderer as the only other established physicians in town.

Commissioner of Health and Welfare, Dr. Wallace Chapman, has announced termination of the Alaskan contract with Morningside Hospital, Portland, Oregon, for the care of mentally retarded, psychiatric, and geriatric patients. This contract which has been in effect since 1904 is no longer necessary due to "the construction of new facilities, and the development of community programs and resources".

FAIRBANKS: In a referendum conducted after the Fairbanks Flood the voters of Fairbanks again turned down a hospital bond issue. As a result they lost a special state disaster contribution to a new hospital which was contingent upon passage of the local bond issue. The town is now on definite notice by the Sisters that they will close St. Joseph's Hospital next summer. Obviously a town of this size and isolation needs a hospital. In addition it would seem unreasonable to expect the growing number of well trained physicians in Fairbanks to remain there,

in the absence of such a facility.

We are impressed by the fact that no physician in private practice has left Fairbanks since the flood. This is despite major financial loss by almost the entire medical community.

SOLDOTNA: Completion of the Peninsula General Hospital is now in question as future loans by the SBA have been refused. With several hundred thousand dollars still needed, this project, which has the support of the Anchorage Medical Society, needs all the help it can get. It is obviously essential to complete this facility but the question now is "How"?

ANCHORAGE: Dr. David Dietz of Rochester, N.Y., has joined the Doctors Clinic. He is board qualified in thoracic surgery.

Dr. Thomas Harrison of Portland, a board qualified ophthalmologist, has opened a private office in Ophthalmology.

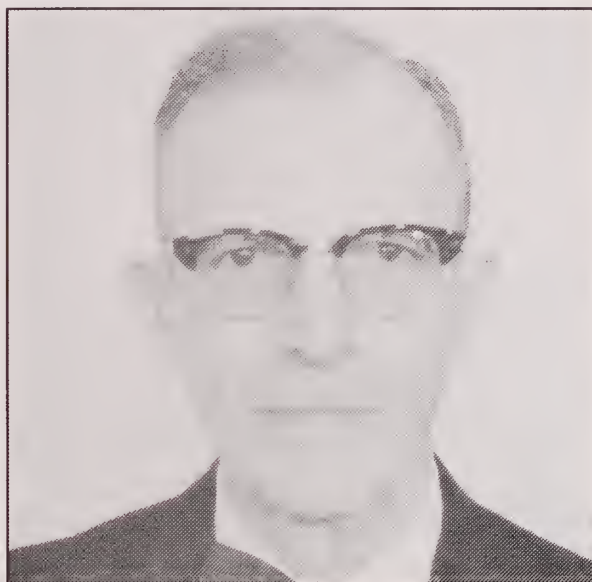
Dr. Theodore Shohl got his private pilot's license.

SAN FRANCISCO: A surprise resolution by the Alaska Delegation at the Annual American Heart Association meeting, to "prohibit cigarette smoking at all official Heart Association meetings and offices", was passed amid considerable tumult and over the loud objections of those delegates so addicted.

Doctor Paul G. Isaak of Soldotna was honored as the physician of the year for his pioneering medicine on the Kenai Peninsula and for his work and perseverance in establishment of the Central Peninsula Hospital, the first hospital in Alaska's most widely growing area.



Doctor Arthur Wilson, Sr., of Ketchikan received the Association's 1967 community service award for his years of service to the community of Ketchikan.



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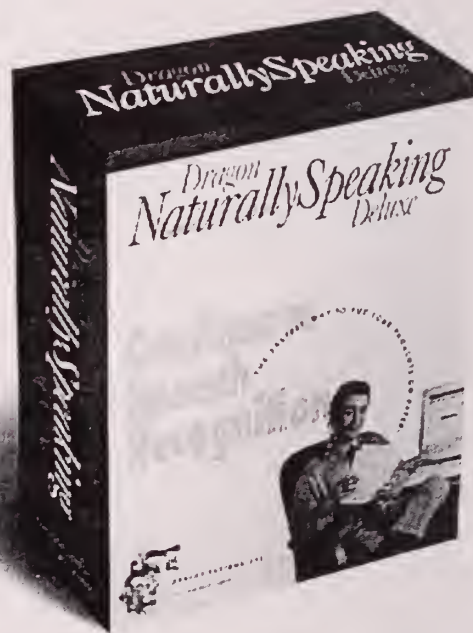
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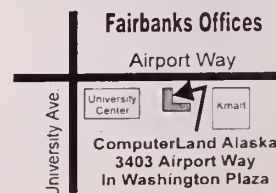
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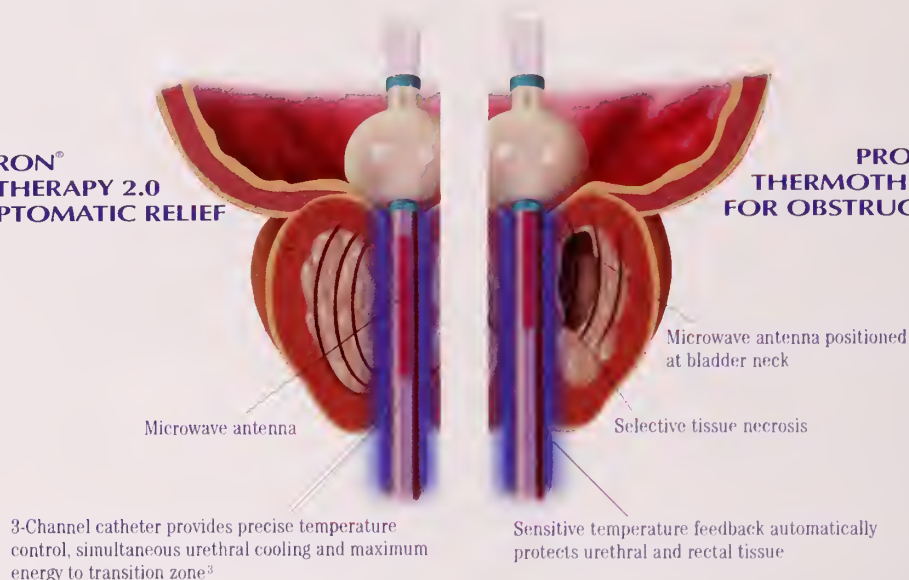
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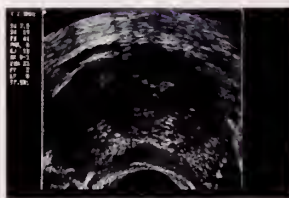
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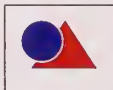
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1. Prostatron: FDA Study, FDA Summary of Safety and Effectiveness (SSE) 2. de la Rosette, Journal of Endourology, August 1997
3. Berry et al., Current Opinions in Urology 1995, 5:3-9
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THE TOMERA TECHNIQUE: HIGH ENERGY TRANSURETHRAL THERMOTHERAPY WITH LOW ENERGY MORBIDITY

KEVIN M. TOMERA, MD⁽¹⁾
FRED M. TOMERA, MD⁽²⁾

ABSTRACT

Transurethral Microwave Thermotherapy (TUMT) is a unique and promising method of treating benign prostatic hyperplasia. Clinical outcomes after high energy protocol TUMT 2.5 are comparable to transurethral resection of the prostate. Previously this increased efficacy has had greater morbidity than lower energy protocol TUMT 2.0 with catheterization required in all patients. A technique of careful preoperative patient teaching, intravenous ketorolac and remifentanyl; patient discomfort is minimized, bladder spasms avoided, and requirement for catheterization infrequent. In 16 consecutive patients, only four required catheters despite an average energy of 155 KJ and a maximum energy of 208 KJ.

INTRODUCTION

Transurethral microwave thermotherapy (TUMT[®]) is a unique technique of microwave radiative heating and conductive cooling. Microwave heating sufficient to destroy prostatic adenoma without unnecessary damage to other tissue can be achieved. Devonec et al, (1) Arai et al, (2) DeWildt et al (3) and Baba et al (4) have shown that successful clinical outcome is thermal dose dependent. Recently, a high energy software (2.5)* has received FDA approval. Clinical outcomes of this ambulatory procedure have shown it to be comparable to the standard surgical procedure or transurethral resection of the prostate-TURP (5).

This high energy thermotherapy has been ex-

pected to require catheterization in almost all patients (6). We describe a technique which minimizes patient discomfort, maximizes energy delivery, and most patients do not even require short-term catheterization.

TECHNIQUE

Carter and associates (7) have described the basic technique of TUMT on the Prostatron[®]. Both sites involved in this study used the basic technique originally described with these additional refinements to the treatment protocol after teaching sessions by one of the original United States clinical investigators (kmt) (8).

Preoperative patient teaching. In addition to routine instructions such as nothing by mouth for at least six hours, patients are specifically informed to expect discomfort and the urge to urinate. They were further informed that if these did not occur, the urologist was not providing an adequate treatment.

Exclusion of very small prostates. Very small prostates less than 35 mm in length and or total weight less than 30 gms are excluded.

Intravenous fluids. A standard IV is started and because of the age group and to be compatible with the medication usually D₅W is the chosen fluid.

Ketorolac administration. Ketorolac (Toradol[®]) is administered intravenously 20 minutes prior to the procedure. A dose of 30 mg is administered unless allergy to aspirin, age, renal insufficiency, history of GI perforation, ulcer, bleeding in which case at the physician's discretion ketorolac is omitted or reduced to 15 mg.

*Edap-Technomed Inc., Burlington, Massachusetts

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(2) River Forest Microwave Prostate Center, River Forest, Illinois.

Prostaprobe Warming. The prostaprobes are prewarmed to body temperature in a warming cabinet or if unavailable placed in the patient for ten minutes by the clock before calibration.

Anti-torque of Rectal Probe. In some patients, because of their anal canal there is a tendency for the rectal probe to angulate into the prostate. The posterior string while helping secure the probe can accentuate this. The urologist by refastening and or manual declination reduces this artifact. Microwave energy is never administered unless the rectal probe is properly positioned in the rectum.

Urethral cooling command is used during power ramping. The urethral cooling command or F2 command manually decreases the urethral coolant temperature. The F2 command is used to minimize urethral shutoffs during periods of increasing power.

Manual power interruption is for emergencies only. The operator manual power interruption is not used unless all other interventions fail.

Exclusion of Finasteride patients for two months from drug cessation.

Administration of Midazolam (Versed®). A small dose of 0.5 mg is given and if needed repeated after ten minutes.

Continuous infusion of Remifentanyl. (Ultiva®) Conscious sedation guidelines must be followed. Monitoring must include pulse oximetry on a continuous basis. Resuscitative and intubation equipment, oxygen, and an opioid antagonist must be readily available (9).

Continuous infusion of remifentanyl should only be administered by an infusion device. We use a Baxter Infusor® with the smart card for monitored anesthesia for remifentanyl. One mg vial of remifentanyl is diluted to a final volume of 40 ml in a 50 cc B-D syringe making a final concentration of 25 mcg/ml.

Infusion is started only after monitors are connected, baseline vital signs are stable, premedication with ketorolac and midazolam, and treatment phase is entered. Initial infusion is usually low or 0.05mcg/kg/min prior to prostaprobe insertion. As power is ramped upwards, titration upward with each power step is usually necessary. Adequate titration is determined by minimization of the feeling to urinate and absence of bladder spasms.

Continuous infusion is stopped at least three minutes prior to termination of microwave power.

COMPLICATIONS

No significant adverse events have occurred in the sixteen patients.

Slight nausea but no emesis has occurred most likely related to the remifentanyl.

Three patients required 2 l/min nasal cannula to maintain both adequate analgesia and oxygen saturation.

RESULTS

The average total energy delivered was 155kJ with 81% of the patients receiving greater than 120 KJ. The maximum energy was 208.5 kJ.

Patient comfort was excellent with the pain usually 0-3 on the visual analogue pain scale. While the urge to urinate occurred, bladder spasms were rare.

Only 4 patients required catheterization after the procedure. All voided upon removal of the catheter which was removed at the surgeon's discretion at three to six days. No prolonged catheterization was necessary.

DISCUSSION

The Prostatron user's manual (TMS 730 606 C) reported all 189 patients after protocol 2.5 were catheterized, with the catheter generally remaining for at least one week with a mean of 17 days and median of 8 days. The Prostatron user's manual reported 32% of low energy protocol 2.0 patients required catheterization for urinary retention with most catheters out at one week.

The Tomera technique avoided catheters in 75% of patients. In the remaining 25%, patient catheters were out three to six days afterwards.

The substantial difference in catheterization is not because of energy difference. The energy delivered in these sixteen patients is similar to that reported after high energy thermotherapy (10).

The difference in catheterization has to be related to the Ketorolac administration or remifentanyl. Ketorolac was chosen because its analgesia has been compared to morphine but being a nonsteroidal antiinflammatory structurally related to aspirin without sedation or respiratory depression. However, its' previous use in thermotherapy increased patient tolerance during and post treatment (11) but does not substantially alter catheterization (8).

Therefore the difference in catheterization is related to remifentanyl or Ultiva. Remifentanyl is a

unique opioid that is rapid metabolized by plasma esterases. Rapid onset of action, rapid distribution and elimination processes are independent of duration of drug administration. Remifentanyl not only made conscious patients comfortable but it eliminated the bladder spasms. We believe that the elimination of the physical trauma secondary to repetitive bladder spasms is the primary cause of post transurethral microwave thermotherapy and not the heat per se. Supportive evidence for this is the well known experience of urologists of urinary instrumentation without any heat causing post procedure urinary retention e.g. post cysto retention. Additionally, prior to remifentanyl most post TUMT retentions occurred within 4 hours while the peak of post thermal edema is 12 to 36 hours.

Midazolam in small doses is recommended not only to combat patient anxiety but it substantially reduces the incidence of nausea in monitored anesthesia care studies at the recommended doses of remifentanyl (9).

CONCLUSION

This technique maximizes energy delivery and patient comfort in a safe and simple manner. The use of appropriate analgesia that avoids thermal induced bladder spasm not only minimizes patient discomfort but also morbidity.

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The Financial Impact of Alcohol-Related Emergencies on a Rural EMS System

William Kriegsman, EMT-P, RN⁽¹⁾

William Anthes, MD⁽²⁾

Hypothesis: Alcohol is a major factor in ambulance responses in rural Alaska; alcohol-related emergencies significantly increase the expense of operating an advanced life support ambulance service.

Methods: A prospective analysis was performed on emergency medical responses one year, ending September 30, 1997. Data were collected from medical records, police documents, and court records.

Analysis: Each ambulance response was analyzed for the presence of alcohol. The departmental budget was reviewed to separate out fixed and variable costs. Between these analyses, a determination was made regarding the actual cost of all alcohol-related ambulance responses.

Results: Six hundred eighty-one patients were included for study. Alcohol was a factor in one hundred ninety-one (28.0%) of these patients. The cost to the community for alcohol-related responses amounted to \$81,503, representing 19.2% of the budget.

Conclusion: The cost to respond to alcohol-related emergencies represents a significant fraction of Ketchikan's total emergency medical budget.

INTRODUCTION

Alcoholism is a problem of significant proportions in rural areas and has been found to be even greater in Alaska where alcohol-related hospital admissions are the highest per capita of any of the United States (1). In addition to high rates of hospitalizations, the age-adjusted mortality rate for Alaska is the highest in the country, and even higher in rural areas (2). Short-term and long-term use and abuse of alcohol leads to emergencies that require the response of Emergency Medical Services (EMS) personnel (3-5). Alcohol-related emergencies include suicide (6),

motor vehicle accidents (7), domestic violence (6), seizures (8), assaults (6,9), and gastrointestinal bleeding (10). It has been estimated that alcohol contributes to 100,000 deaths per year in the United States (11), with a sizeable portion involving traumatic injuries to youths (12).

This study sought to determine the magnitude of alcohol-related emergencies within a Southeast Alaskan community, and to assess the resulting economic impact on the local pre-hospital EMS system. The impacts upon emergency departments and in-patient hospital facilities were not assessed.

METHODS

All EMS responses for the period August 1, 1996 to July 31, 1997 were evaluated prospectively for the presence of alcohol as a contributory factor. Determination of alcohol presence was based upon physical assessment by paramedics and emergency medical technicians (EMTs), evaluation by police officers, review of court records, and examination of hospital medical records. Corroboration between multiple independent sources was used when possible.

At the conclusion of every emergency response, paramedics and EMTs completed an alcohol reporting tool specific to this study. Hospital medical records were consulted to determine the results of blood alcohol testing and admitting or discharge diagnoses related to alcohol ingestion. A threshold level of 0.1% was considered indicative of alcohol involvement; this level was based upon the Alaska definition of intoxication for the purposes of operating a motor vehicle (13).

When police were involved, such as at motor vehicle accidents and domestic violence responses, police reports were consulted to determine the presence of alcohol. Specific attention was aimed at breath and blood alcohol analysis results (14) and legally admissible sobriety testing. Court records were consulted when police records demonstrated evidence of alcohol involvement.

The budget for the EMS agency was broken down into two different basic categories, fixed costs

- (1) Requests for reprints should be directed to: City of Ketchikan Fire Department, 319 Main Street, Ketchikan, AK 99901 and Ketchikan General Hospital Ketchikan, Alaska.
- (2) Attending Physician, Internal Medicine, Ketchikan General Hospital, Ketchikan, Alaska.

and variable costs. Fixed costs are defined as expenses that the agency normally incurs, independent of the call volume. These costs include salaries, administrative costs, travel, and training. Variable costs are expenses that are dependent upon both patient volume and acuity, such as supplies and part of the overtime account. The 1997 municipal budget was reviewed for fixed and variable costs, resulting in the findings in Table 1.

Table 1.

Fixed Costs

Salaries
Benefits
Overtime - Training
Travel
Training
Administration
Equipment Upgrade

Variable Costs

Expendable Supplies
Equipment Wear & Tear
Overtime - Responses

This table divides major budget categories into two sets of costs, defined as fixed and variable. Those costs that are categorized as fixed, are expenses that are independent of call volume. Variable costs are those expenses that are directly related to the volume of ambulance calls.

There were a total of 1091 responses during the study period, which includes responses to medical and trauma emergencies, fire service responses, hazardous materials releases, and inter-facility transports. After eliminating responses that were non-emergent in nature and responses where no patient was contacted, 681 patients were evaluated by EMTs and paramedics. Table 2 illustrates the decision method used for alcohol presence in each response. When multiple methods were used, the most reliable method was credited with the determination.

RESULTS

Of the 681 patients treated by EMS responders, 191 (28%) had alcohol as a contributory factor to their injury or illness. Of the 191 patients with alcohol as a contributory effect, 180 had alcohol involvement as part of their emergency or discharge diagnosis. Attending physicians providing direct patient care made each of these determinations.

The remaining 11 patients were either plaintiffs or defendants in legal proceedings in which alcohol was cited as a factor in conviction. Eight of these cases involved driving or boating while intoxicated and three cases involved domestic violence. An alcohol-related conviction was required in order for the case

to be counted in this study. Data for judicial action were collected through public-access records available through the local court system.

The budget of the emergency medical services division of the fire department was \$417,846 in 1997. The budget was broken into fixed costs of \$338,246 and variable costs of \$79,600. Of the variable costs, \$22,288 was expended on responses to 191 alcohol-related emergencies. This resulted in an average expenditure by the agency of \$117 per response for variable costs.

The fixed cost for operating this EMS agency was \$338,246 for responding on 1091 calls. This represents all ambulance responses, including EMS emergencies, fire service assists, hazardous material releases, and interfacility transports. The portion of the fixed costs for responding to each of these calls was \$310 (\$338,246 for 1091 calls).

As a result, each alcohol-related response expended an average of \$427 (\$117 variable cost plus \$310 fixed cost), which represents 19.2% of the annual EMS budget.

DISCUSSION

The use and abuse of alcohol leads to a wide variety of disorders in Ketchikan patients, which include disorders involving the central nervous system, hepatportal system, and gastrointestinal system (see Table 3). These diseases are manifested as direct effects such as seizures (8) and as indirect

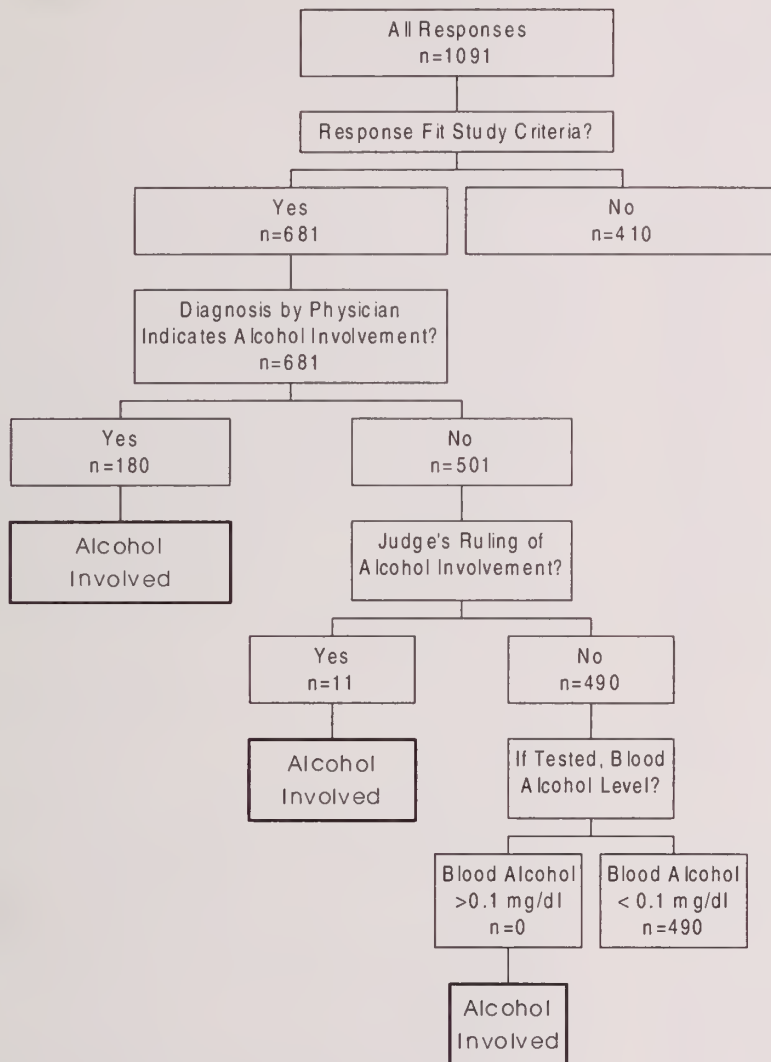
Table 3.

**CAUSES OF ALCOHOL-RELATED
AMBULANCE RESPONSES**

Assault/Suicide (Deadly weapon)	4%
Assault (Fist, foot)	17%
Behavioral	5%
Cardiac/Chest Pain	5%
Decreased Lvl of Consciousness	11%
Drug Abuse/Overdose	6%
Injury (non-assault, non crash)	20%
Intoxication	9%
GI Bleed/GI Symptoms	5%
Vehicle Crash/Pedestrian Struck	4%
Seizure	11%
Syncope	1%
Withdrawal	2%

This table summarizes the types of ambulance calls, by diagnoses, which are related to alcohol. In some cases there was overlap between two or more categories. In those instances of overlap, the cause most directly responsible for the ambulance response was cited.

Table 2.



This chart demonstrates the logic used to determine if alcohol was involved in an ambulance run. It also serves to illustrate the number of patients who fit in each category, as represented by the "n=" in the respective boxes.

consequences such as domestic violence (6). The cost to Ketchikan is considerable due to the loss of productivity and increased health care utilization by the alcohol user as well as effected individuals (for example, occupants of crashed vehicles and victims of an intoxicated assailant). This study attempted to determine the financial impact alcohol within the realm of an emergency medical service.

Alcohol has been previously demonstrated to be a significant factor in many types of injuries and illnesses. The National Highway Traffic Safety Administration (14) has determined that alcohol is involved in greater than 50% of homicides, suicides,

stabblings, assaults, and domestic violence, and greater than 40% of motor vehicle crash fatalities. Alcoholism has also been shown to be the most common chronic disease in trauma victims. In addition, it is estimated that half of all patients admitted for trauma are admitted under the influence of alcohol.

Other studies have shown that the presence of alcohol correlates with increases in the severity of related injuries. The Insurance Institute for Highway Safety determined that a blood alcohol level of between 0.05 and 0.09 increases that relative risk of being killed by a factor of 11 when compared to drivers with blood alcohol levels of 0.00. Different studies have determined that the reduction of legal blood alcohol driving limits from 0.1 to 0.08 can reduce traffic fatalities by between 12% and 16% (15,16).

Alcohol is extremely prevalent in rural Alaskan communities where diminished sunlight, harsh weather, and seasonal employment stresses are significant problems. As a result of these factors, alcoholism and alcohol-related medical emergencies comprise a significant fraction of all ambulance responses. These ambulance responses vary widely from minor complaints to major trauma and acute illness.

The Alaska Trauma Registry is a program designed to collect data from all of the hospitals in the state on patients who have been admitted, transferred, or died as a result of trauma. Data reviewed (17) for the period November 1, 1996 to March 31, 1997 demonstrated seven patients out of fifteen (28%) had alcohol indicated as a factor in the trauma. An analysis of data for the entire state for November 1, 1996 to October 31, 1997 reveals that 255 of the 945 (27%) patients enrolled in the registry (18) had alcohol involvement. The trauma registry information coincides very closely with the results of this study (28% alcohol involvement).

The financial impact of these responses on a small community can be substantial. Most communities in Alaska are small villages connected by air with hub cities of 3,000 to 30,000. The vast majority of EMS organizations within Alaska are non-profit and are funded through tax revenues, donations, and grants. As is found in many areas of the United

States, these EMS agencies are being asked to perform greater call volumes and additional services without adequate corresponding funding increases. This reduction in resources leads to an inquiry regarding the utilization of EMS services for injuries and illnesses that can be effected, such as alcohol-related injuries.

In Alaska, the top four causes of injury death in children all have distinct potentials for alcohol involvement (19). These causes include suicide, motor vehicle crashes, homicide, and drowning. Since Alaska's rates for injury mortality are approximately 50% greater than national averages (20), it is possible that this Alaskan community could have significant under-reporting of alcohol-related traumatic deaths when alcohol was not cited on the death certificate or hospital records as having been a factor in the death.

As this research has demonstrated, both chronic and acute alcohol use lead to a substantial number of ambulance responses. This study, though, probably underestimates the true impact of alcohol on this agency. Examples of these unaccounted responses include fires resulting from intoxicated individuals, intoxicated patients who leave the scene prior to ambulance arrival, and patients with an unrecognized, or unclear, correlation between alcohol and their presenting condition (21,22).

Numerous communities in Alaska are "Dry" or "Damp". A "Dry" community prohibits the sale, possession, distribution, or consumption of alcohol. A "Damp" community allows personal importation and consumption, while prohibiting distribution and sale of alcohol. Recent research by Landen et al (23) demonstrated a clear connection between the restriction of alcohol possession in a community and the relative risk of death. This increase in mortality rate was evident in alcohol-related injury deaths among native residents of remote communities. In fact, the risk of alcohol-related injury death among Alaska Natives was 2.7 times greater for residents of wet villages than for residents of dry villages.

CONCLUSION

The cost to respond to alcohol-related emergencies represents a significant fraction of the EMS budget for Ketchikan, a rural Alaskan community.

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No financial support has been received for this project.

THE PAPERWORK NIGHTMARE

Every Doctor that wants privileges at a medical facility must fill out an application, and once approved, the Doctor must reapply for those privileges every two years. The established system requires a myriad of duplication and paperwork, because each facility requires its own application that asks the same questions and requires the same documentation. This gobbles up time and precious resources of the hospital and Doctor alike.

Now comes a new idea to Alaska, Centralized Credentialing, run by Alaska Medical Staff Services. The concept is accepted by JCAHO and is being used very successfully in the lower 48 states. Under this program the Doctor fills out one application every two years, no matter how many facilities he/she requests privileges with. This will eliminate over one thousand applications every two years, just in the area from Kodiak to Palmer. Also, many thousands of letters for verifying privileges, and all the multiple queries to Doctors for copies of licenses, DEA, and other documentation, are no longer needed.

The program is coming along well. Alaska Medical Staff Services now credentials 80% of the medical staff at Providence Hospital and 50% of the medical staffs at Valley and Soldotna - but for other facilities. When these three facilities join the program, it will eliminate five hundred applications - just like that!

Cost is not a factor here - the program saves a facility a minimum of 40% of what it is spending today. Quality is not a factor either - Alaska Medical Staff Services has endured three JCAHO surveys in 1997 and came out with a perfect record.

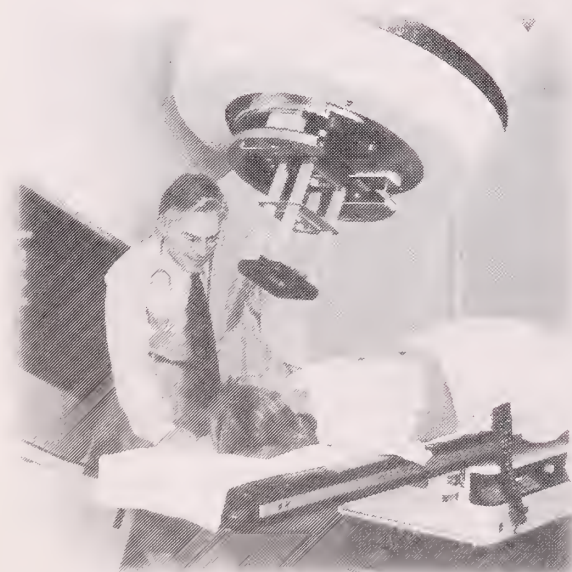
Doctor support is a factor, because if the Doctors don't ask for the program it won't happen. Your help is greatly appreciated.

If you have any questions or comments, please contact us at (907) 563-3553, or drop by our offices at the Alaska State Medical Association building, 4107 Laurel Street, in Anchorage.

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Alaska turns to us for good health.

NATIONAL HEALTH SERVICE CORPS CELEBRATES 25 YEARS OF DELIVERING HEALTH CARE IN UNDERSERVED AREAS

Contributed by Molly McGrath⁽¹⁾

The National Health Service Corps (NHSC) is celebrating its 25th Anniversary. The State of Alaska is saluting the NHSC member health care providers who have committed time during their medical careers to deliver health care to the residents of Alaska in underserved areas, and who continue to serve Alaskans by improving access to health care services.

Since 1972, the NHSC has played a critical role in bringing the services of physicians and other clinical health care professionals to underserved rural areas and urban neighborhoods lacking access to affordable health care. Of the 20,000 clinicians that have participated in this national program, approximately 70 percent were placed in rural areas. During the last four years, a total of 4,719 NHSC providers have been placed in rural communities nationwide, including 2,909 physicians.

Of the many health care providers who have served the NHSC in Alaska, over a hundred providers continue to practice in the State. They serve as providers of health care in community health centers, administrators of health care facilities, and educators of future health care providers. Three of the original four NHSC members who came to Alaska in 1972 are still practicing in the State.

The NHSC continues to serve the residents of Alaska and offers opportunities for those interested in pursuing a career in medicine. Health care facilities located in underserved areas are eligible for incen-

tives to recruit health care providers through the NHSC Loan Repayment Program and the NHSC Scholarship program. Students who begin training in a primary care health profession can apply for the NHSC Scholarship. The scholarship pays for a student's tuition and living expenses in exchange for an obligation to provide health care services in an underserved area for a specified period of time immediately following graduation. Also, primary care health professions students in training can participate in the NHSC Fellowship program offered in 33 states. The Alaska NHSC Fellowship program is coordinated by the State of Alaska Division of Public Health and is called "Alaskan Exposure." The program funds the placement of students in rural communities or facilities serving underserved populations during their clinical training years. Students training as primary care physicians, nurse practitioners, and physician assistants are eligible for the program. For more information on NHSC programs, contact the NHSC Information line at 1 (800) 221-9393 or the Alaska Primary Care Office at (907) 465-3091.

Governor Knowles has proclaimed April as NHSC Month. Please join the State of Alaska as we salute the many contributions made in our state by NHSC providers. You will find current and alumni NHSC providers busy providing health care services in Fairbanks, Metlakatla, Galena, Shishmaref, Eagle River, Anchorage, Ketchikan, Nome, McGrath, Sitka, Juneau, Valdez, Soldotna, Unalaska, North Pole, Dillingham, Petersburg, and Bethel.

(1) State of Alaska, Department of Health & Social Services, Division of Public Health, Alaskan Exposure Program

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Alaska Announces

Year 2000 Childhood Immunization Initiative

Childhood immunizations are the single most effective public health tool available in modern medicine. Diseases such as measles, mumps, rubella, tetanus, polio, pertussis and diphtheria are rare to nonexistent today in Alaska. But when they do occur, they can take lives and leave serious disabilities among those who survive. And these vaccine-preventable diseases are both difficult and costly to treat.

Public and private health care providers in Alaska have long recognized the importance of childhood immunizations. In fact, Alaska historically has been a leader in the U.S. in developing effective immunization programs. Alaska was the first state in the country to implement:

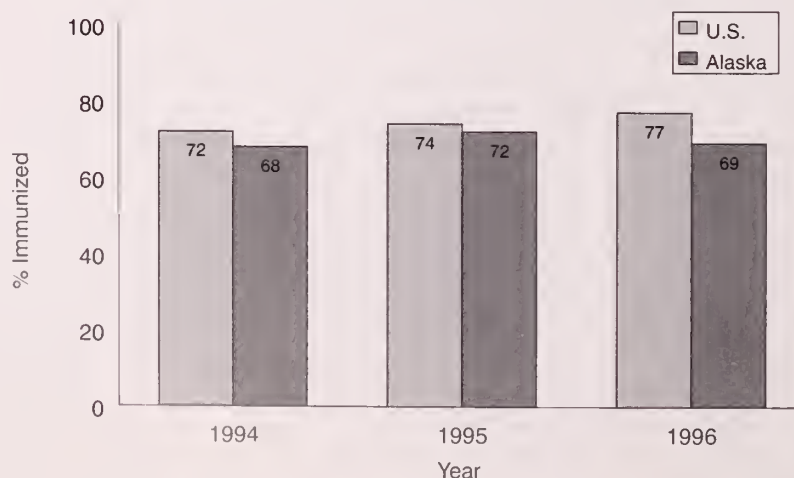
- universal vaccine distribution, making immunizations available to all Alaskans, regardless of ability to pay; and
- statewide vaccine programs to prevent:
 - ❖ hepatitis B;
 - ❖ meningitis caused by *Haemophilus influenzae* type b; and
 - ❖ community epidemics caused by hepatitis A.

Additionally, Alaska was the first state to require that all children in schools and child care facilities be immunized against measles, rubella, diphtheria, tetanus, pertussis and polio. This state law has been the key to eradicating vaccine-preventable diseases in Alaska. More than 98% of children in Alaska schools are immunized against these diseases. From the time the law was enacted in 1976 until the spring of 1996, these dangerous diseases were occasionally seen in Alaska, but never spread within schools. However, a 1996 outbreak of measles in Juneau demonstrated both inter- and intra-school transmission. As a result of this recent outbreak, all kindergarten and first grade students are now required to have a second dose of measles-containing vaccine before entry into school.

The Challenge

Despite this strong statewide commitment, the 1996 National Immunization Survey indicated that *only 69% of Alaska's two year old children received all routinely recommended childhood vaccines*. Alaska fell to rank #48 among the 50 states in providing all needed vaccines to our children.

Figure 1:
Immunization Completion Rates*, U.S. & Alaska,
National Immunization Survey, 1994-1996



* Completion = 4 DTP/3 Polio/1 MMR/3 Hib for two year old children

Additionally, our older children are in need of vaccines. Most eligible children from 2-18 years of age have not been immunized against hepatitis A, and many children over the age of three still need to be vaccinated against hepatitis B. Once varicella vaccine is available in Alaska, children from 12 months to 18 years of age who have not had chickenpox will need this vaccine.

How have we fallen from a position of leadership, ranking number 1 in the nation, to a ranking of 48th in the country? Among the various reasons, the public health system has taken on major new responsibilities, stretching existing resources and personnel capacity to the limit. Alaska's population has increased almost twofold since 1980, while childhood immunizations have increased in both number and complexity. (Table 1)

Table 1: Population and Immunization Indicators, 1980 & 1996		
	1980	1996
Alaska population, 0-19 yrs of age	110,420	207,114
# vaccines routinely recommended	7 ^a	11 ^b
# individual doses required to completely immunize a child through 2 years of age	8	18
# of immunizations required to completely immunize 0-19 population	883,360	3,728,052
^a diphtheria, pertussis, tetanus, polio, measles, mumps, and rubella		
^b add hepatitis A, hepatitis B, <i>Haemophilus influenzae</i> type b, and varicella		

The Goals

To improve Alaska's immunization levels, we must target two groups:

1. the newborn through 2 years of age population
2. the 3-18 years of age population.

The specific goals for reaching these two targeted groups are shown below:

Goals: Year 2000 Childhood Immunization Initiative

- ✓ **Two year-olds:** Immunize 90% of children by their third birthday with 4 DTP/DTaP (against diphtheria, tetanus, and pertussis), 3 polio, 1 MMR (against measles, mumps, and rubella), and 3 Hib (against *Haemophilus influenzae* type B);
- ✓ **Hepatitis A:** Immunize all children 2 to 18 years of age;
- ✓ **Hepatitis B:** Immunize all children 0 to 18 years of age;
- ✓ **2nd Dose MMR:** Immunize all children attending school (K-12) with a second dose of MMR vaccine.

What needs to be done?

Three major strategies are essential:

- Increase demand for the vaccines by the public, parents, children, and the community;
- Assure that the medical infrastructure can meet the demand;
- Eliminate barriers to vaccination.

Both the private and public health care sectors in Alaska must work closely together if we are to improve

our immunization levels. Statewide, the public sector delivers 56% and the private sector 44% of childhood immunizations. These percentages vary widely by region. In Anchorage and the Matanuska-Susitna Valley, 71% of immunizations are administered by private health care providers, while in the Southwest only 3% are provided by private providers. A major statewide initiative must have the commitment of all immunization partners to successfully deliver vaccines to Alaska children.

To develop an understanding of the work which needs to be done, we must examine our current immunization efforts and clearly define where unmet needs lie. Approximately 250,000 doses of vaccine are currently delivered annually to Alaska children. To achieve our goals, we must deliver *one million doses* of vaccine by January 1, 2000. Different strategies are needed for different areas of the state. And different strategies are needed to increase the immunization rates of two-year-old children, grade school children and adolescents.

Currently, local community immunization coalitions are forming and meeting around Alaska. These alliances include wide representation from the community. Each coalition is developing an immunization plan specifically to meet its regional needs. Each group's first priority is to define existing resources that can be enhanced and mobilized immediately. Coalitions also will receive support from augmented State Immunization Program activities, including the provision of public service announcements, speakers, coalition consultations, and educational materials for parents, children and health care providers.

What can YOU do?

As Alaska physicians, you play a vital leadership role in our efforts to increase Alaska's immunization levels. Multiple opportunities exist for you to support these efforts on both a community level and within your own practice. Here are a few ideas:

- ***Establish a reminder/recall system within your practice.*** Many parents assume their children are "up to date" with their immunizations unless they are reminded of the need for additional vaccines.
- ***Remain current with the immunization***

schedule and vaccine changes. Although the complexity of and changes to the immunization schedule increase the difficulty of staying abreast of the latest developments, multiple opportunities exist to remain current and also earn CMEs. Several times per year the Alaska Immunization Program sponsors satellite videoconferences conducted by the Centers for Disease Control and Prevention in Atlanta. These programs are provided in over 18 locations throughout the state. Additionally, tapes of the programs are available for your use after the conferences, though CMEs can be earned only by participation in the "live" event. Videoconferences scheduled for the remainder of 1998 are:

April 9, 16, 23, 30	Epidemiology & Prevention of Vaccine-Preventable Diseases
June 4	Adult Immunizations
September 10	Immunization Update

For information on the times and locations of these conferences, contact Kelly Keeter at 269-8000.

- ***Examine your clinic flow and systems operation to eliminate missed opportunities to vaccinate.*** Is it easy for a parent to bring a child to your clinic or office for immunizations? Does it require a half day off from work, or only a few minutes? Do you have a "fast track" system for childhood immunizations? Is each child's immunization status assessed at every visit and then immunizations provided as needed?

The Alaska Immunization Program can assist you in the evaluation of your unique practice setting. An assessment can include a computer-based survey (CASA) that will identify the immunization rate of your patient population. Initial feedback can be immediate, and in-service education is available for office or clinic staff to discuss the survey results. Such on-site assessments are **strictly confidential** and designed to meet the needs of each clinical practice situation. For further information or to schedule an assessment, contact Sherry Kew at 269-8000.

- ***Emphasize the importance of immunizations with your patients and with the community at large.*** The most important variable between whether

Editorial

or not a child is completely immunized is **provider recommendation**. The importance the physician places on immunizations is directly proportional to the importance his or her patients place on it. In addition, the physician is the most important resource for parents who have questions about vaccine efficacy and safety.

• **Become involved in your local immunization improvement plan.** As a community leader, your involvement will be invaluable to local planning efforts in support of the *Year 2000 Childhood Immunization Initiative*.

We must all find new ways to improve the delivery of immunizations to children in Alaska. By working together, we can increase immunization levels and protect our children from serious and *preventable* diseases.

For additional information or materials on immunizations, to obtain information on local immunization activities and planning groups, or to obtain copies of the Alaska Year 2000 Immunization Initiative, contact the Alaska Immunization Program at 269-8000.



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This winter issue of Alaska Medicine comes at a wonderful time of year in our great state. As the days begin to bring sunlight back to our lives the pace of our practices quickens. The change brightens our patients, our office and us. This issue, however, includes a tough wintertime issue as well as the poignant reality of our greatest winter hazard – alcohol and it's related direct and indirect trauma. The confirming evidence of a basic expenditure of at least a quarter of a local medical emergency services budget demonstrates the ongoing need to control this problem. We often forget in the larger communities the dramatic effects that smaller communities face with limited resources and personnel in tackling these problems. The following study as suggested by William Kriegman, et al to differentiate the benefits of “damp” and “dry” status of rural communities would be an excellent contribution in the potential control of this problem.

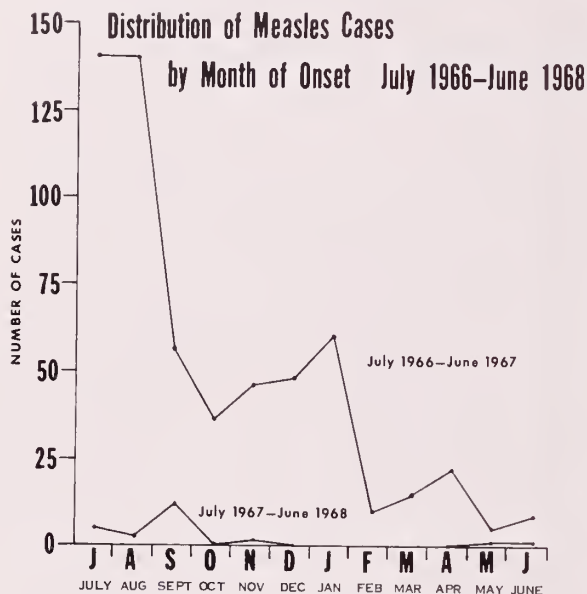
We also are faced with the change in our practice patterns and our surgical colleagues face the ever increasing pressure to provide non invasive/minimally invasive therapies for our patients and referral practitioners. This will be an ever increasing pressure of practice. Tomera, et al supply a look at a new alternative to the traditionally “surgical correction only” prostate obstruction problem. Coupling technology with new pharmacology is the pattern of the future which will further enhance the ability of the practitioner to offer minimally invasive alternatives to an ever increasing population—baby boomers as they begin to reach their golden years. The new pressures we will all feel and many personally experience make this an exciting yet paradigm shifting time. We will continue to try to focus on these new alternatives with information from all our readers. We can together keep our premier status as “cutting edge” providers of care in Alaska before our peers and our public.

Bill Clark
Editor

From Out of the Past — Thirty Years Ago. . .

Gloria K. Parks, MD ⁽¹⁾

ALASKA'S MEASLES ERADICATION PROGRAM



The combined efforts of the Department of Health and Welfare, U.S. Public Health Service Assignees and the medical profession in Alaska have brought about virtual eradication of rubeola (red measles) in Alaska.

PROMINENT PAINTER CAPTURED BY ALASKA MEDICINE

Fred Machetanz is an Alaskan artist who works in all media but now prefers oil painting and lithography.

He came to Alaska in 1935 with an M.A. and B.A. from Ohio State University to spend six weeks at the Eskimo village of Unalakleet. He has been an Alaskan ever since, devoting all his art to Alaskan subject matter.

With World War II, Machetanz volunteered for duty in the Navy asking for Alaskan service which he received with three out of four years spent in the Aleutians. At the finish of the War, he had the rank of Lieutenant Commander and received a Bronze Star for his work in Naval Intelligence.

Mr. Machetanz has kindly permitted Alaska Medicine to reproduce a number of his paintings as illustrations in forthcoming issues.



BUSH DENTISTRY 1968 STYLE

By Joseph R. Cumming, D.D.S.

Dental care has been provided to people in the Alaskan "Bush" for many years by many dentists, starting way back in the days when the belt driven handpiece was powered by a little Eskimo or Indian boy on a foot treadle. Although some may not believe it, I was not in dentistry in those days, but the men who were here had a difficult job to do. I shall never forget using the belt driven handpick that is now in my lab, for doing all the operative dentistry when my wife and I flew an old Cessna around the Bristol Bay area and out along the Aleutian Chain. The use of slow speed to prepare cavities seems almost like a dream now, no one would want to use it again. However, we enjoyed those days, and the years that followed in Nome, with trips to villages in the Arctic. We often used my rather mixed breed dog team to take hunting trips, and usually took along some dental supplies and instruments to take care of an emergency at any village or hunters' cabin we might visit. We had to



A trip from Nome to Shishmariff



Type of transportation provided on most trips.

carry the anesthetic inside our "parkys" to keep it from freezing and we didn't always have the right instrument, but we did the best we could with what we had, and would return later with more complete care.

How well we remember arriving at one village with no anesthetic, and with the only instruments available being a screwdriver and pair of water pump pliers. After several minutes in boiling water, they became quite useful in elevating and extracting two very painful teeth from one rather ancient Eskimo. He claimed to be over 100 years old.

In recent years however, portable high speed dental equipment has been developed which allows us to do operative work in the field comparable to that in our regular office. We now can have adequate suction to afford a dry field and administer topical fluoride, and we have portable x-ray equipment that can take good diagnostic films.

MUSHROOM POISONING IN ALASKA *Helvella*

by Phyllis E. Kempton and Virginia L. Wells

Mushroom poisoning is not a serious problem in Alaska but when it does happen, it can be frightening as well as dangerous for the victim and baffling for the physician because of its infrequent occurrence and poor documentation.



Helvella infula

The mushroom involved in this case was *Helvella infula* which is 2-4 inches tall and is characterized by a two to four-lobed, saddle-shaped, brittle cap which varies in color from yellow-brown through chestnut-brown to dark brown. The surface is usually smooth when young becoming rugosely wrinkled with maturity. The stalk is tinged with the cap color though usually much paler, and is ribbed or indented near the apex. It is often common in Alaska during August and September.

Little is known about the edibility of *H. infula*. Some authors claim that it is an edible mushroom while others believe that it is poisonous to some but edible for most people. After hearing of Mrs. B's experience, we can only recommend that *H. infula* be avoided for food.

A closely related species, *Helvella esculenta* is also common in Alaska but occurs during May and June. The cap of *H. esculenta* is also brittle, about the same color as that of *H. infula* but, rather than being saddle-shaped, it is more globose, usually much more wrinkled or cerebriform, and larger.



Helvella esculenta

W/A REGIONAL MEDICAL PROGRAM PROJECTS APPROVED

By Marion H. Johnson
Director of Communications,
W/A Regional Medical Program

During his recent visit to Alaska, Dr. Robert Q. Marston, National Director of the Division of Regional Medical Programs, urged Alaskans to use the Regional Medical Program as a catalyst to facilitate a cooperative association among health professions and institutions appropriate to the needs and resources of their region.

Anchorage Cancer Program, Southeast Alaska Project and Alaska Medical Library—received funds for operation from a \$1,038,003 grant to the Washington/Alaska Regional Medical Program by the National Institutes of Health.

The Anchorage Cancer Program will provide funds for Alaska's first super-voltage radiation therapy unit; in addition to providing an important therapeutic tool, the installation of the 'cobalt bomb' in Anchorage should serve as a focus for augmenting professional and public education programs regarding cancer in Alaska. The 'cobalt bomb' will not only stimulate interest in cancer detection and therapy, but will strengthen the position of those who have been encouraging the improved data gathering and follow-up of cancer by way of cancer registries and associated programs.

To insure proper use of high voltage equipment in the region, the first full-time radiation physicist consultant will be hired with Regional Medical Program funds.

Southeast Alaska project will provide continuing education opportunities never before available to medical personnel scattered throughout this vast

region of 79,000 square miles. Continuation of the locum tenens program will be assured with the funding of this project. A pool of physicians is being organized to relieve solo practitioners such as Dr. Dale, so they may continue their medical education outside their local areas.

In addition another significant need has been met with the Alaska Medical Library Grant approval and funding. This facility will be located at the Alaska Native Medical Center in Anchorage where library work is already in progress, under the direction of Dr. Walter Johnson. In effect the funding will permit expansion of services of an enlarged medical library to all physicians in Alaska on an equal basis. [This was the beginning of the AHSL.]

ALASKA'S NEW McLAUGHLIN YOUTH CENTER

By J. Scott McDonald
Commissioner of Alaska
Department of Health and Welfare

On July 13, 1968 the 49th State became the 50th State in the nation to establish its own training institution for juveniles. On that date the George M. McLaughlin Youth Center was dedicated as a co-educational school for boys and girls whose involvement in trouble with the law is so deep seated as to require 24-hour residential treatment and supervision. The Center is headed by Superintendent Howard Leach and has the mission of receiving, studying, treating and reporting on boys and girls ordered into its care.

Prior to McLaughlin's opening, Alaskan boys requiring institutional commitment were sent under contractual agreements to state and federal facilities in California, Utah, and Colorado, while girls generally were placed in convents of the Good Shepherd in Washington and Montana.

(continued on next page)

— CORRECTION —

Correction to Volume 39 No. 4, 1997
Alaska Medicine, on page 120, column 2.

Reference 22 to the Chronic Opioids article by Morris R. Horning, MD. It should have read:

22. Schweitzer, Albert *On The Edge of the Primeval Forest*, 1931".

LEVI M. BROWNING, M.D.

1904-1968

by James E. O'Malley, M.D.



Levi M. Browning, M.D. was born in a small farming community in Benton, Illinois, September 3, 1904 and passed away on the 30th day of July, 1968 at the Lackland Air Force Base Hospital in Texas, of carcinoma of the lung with complications.

Dr. Browning completed his pre-medical requirements at the University of Illinois in Champaign and Urbana, Illinois. He then entered the College of Medicine at the University of Illinois and graduated in 1930. After his internship at Augustana Hospital in Chicago, he went to the Milwaukee County Hospital in Wauwatosa, Wisconsin, where he was Junior and Senior Resident in Surgery from 1931 to 1936.

I first met Levi Browning as a freshman in medical school in 1930, when he was an instructor in Anatomy at the University of Illinois College of Medicine. Shortly after this, he entered the U.S. Army Medical Corps. He served in various places in the United States and in the Far East. He had two tours of duty here in Alaska. The first was when he was Commanding Officer of the 183rd Station Hospital in the Army which was located on the grounds of the Fort Richardson Military Reservation. During this tour the Air Force was formed as a separate service and he transferred to this branch of the Armed Services.

Dr. Browning was in charge of the Medical Department of the United States Air Force Academy for a time at Colorado Springs, Colorado. He assisted in designing what is now the 5004th Air Force Hospital at Elmendorf, and was Commanding

Officer of this hospital for several years before he retired.

Colonel Browning was appointed Commissioner of Health and Welfare for Alaska by Governor William A. Egan during his second term, a position that he fulfilled with great distinction. His administration was marked by the full cooperation of staff and no scandals.

With the change of administration he became associated with the Presidents Committee on Heart, Cancer and Stroke. During his period with the Regional Medical Program, the Regional Medical Library in Anchorage, Alaska was founded at the Alaska Native Service Hospital, complete with a librarian and staff. Construction of Alaska's first Cobalt Therapy unit was also started while he was Executive Secretary of the Alaska R.M.P.

He was well known and respected in the Medical Corps as a most competent surgeon, a troubleshooter of great ability, and lastly and most importantly, a most competent diplomat.

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ALASKA MEDICINE

Volume 40, Number 2

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In this issue: Diagnosis and Treatment of Renal and Ureteral Calculi by *Joe Knight, PA-C*
Use of Exhaled Carbon Monoxide for the Diagnosis of Carbon Monoxide
Poisoning by *Wayne Wallace, BA, RRT*
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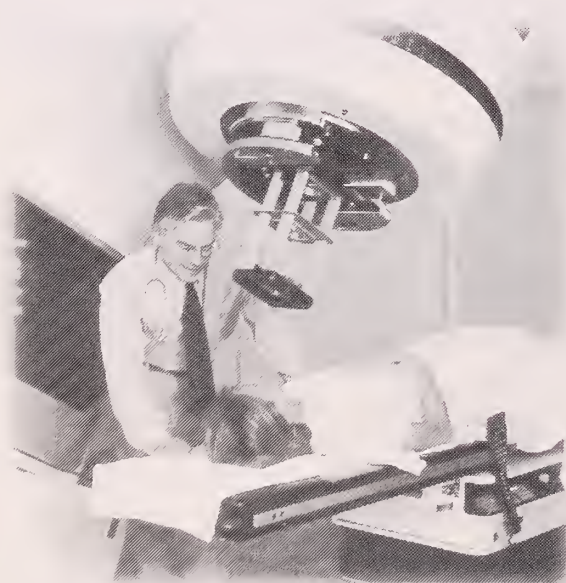
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The scaber stalk mushroom (*leccinum insigne*) is an edible mushroom which grows on roadbanks, open fields, and glacial moraine. The berry is nagoon berry (*Rubus arcticus*), a highly valued berry which grows in southeast Alaska in similar terrain. Photo courtesy of Kenneth W. Moss, MD

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Diagnosis and Treatment of Renal and Ureteral Calculi

Joe Knight, PA-C⁽¹⁾

Abstract

Nephrolithiasis affects about 0.2% of the US population annually with about 5% to 15% of the population suffering at some point in their lives. While 75% of all calculi are calcium based, the remainder are composed of uric acid, cystine, struvite, or are composed of more than one substance. A 1997 policy update by the American Urological Association recommends that stones lodged in the ureter that are not causing excruciating pain for the patient are best initially managed by observation.

Diagnosis and Treatment of Renal And Uretral Calculi

Nephrolithiasis affects approximately 0.2% of the US population annually, with about 5% to 15% of the population suffering at some point in their lives⁽¹⁾. Urinary calculi are the third most common affliction of the urinary tract, exceeded only by urinary tract infections and pathological conditions of the prostate⁽²⁾.

Etiology

About 75% of all stones are calcium based, consisting of calcium oxalate, calcium phosphate, or a mixture of oxalate and phosphate. Mixed stones have more than one component such as a uric acid nidus with aggregation of calcium. Another 10% of renal stones are uric acid based, 1% are cystine based, and the remainder are struvite. In susceptible patients, stone formation begins when urine becomes supersaturated with calcium, uric acid, cystine, struvite, or oxalate⁽¹⁾.

An increased concentration of chemical constituents may be the consequence of either low urine volume (which may be a chronic problem in arid environments) or of increased urinary excretion of stone constituents typified by hyperoxaluria, hyperuricosuria, and cystinuria. Decreased solubility can be indicated by abnormalities in urinary pH; a persistently low pH predisposes to uric acid calculi while a persistently alkaline pH leads to phosphate-containing such as struvite and apatite stones^(3,4).

Supersaturation occurs when the substances that make up the stone are found in large volumes in the urine and when the urine volume decreases. With the nucleation process, sodium hydrogen urate, uric acid, and hydroxyapatite crystals form a nucleus. Calcium and oxalate ions then adhere to the nucleus to form a mixed stone. This is known as heterogeneous nucleation⁽¹⁾.

Signs and Symptoms

Acute onset of pain is the primary symptom of a stone attempting to pass through the ureter. Pain may increase as the ureter proximal to the stone becomes distended and edematous. The size of the stone does not necessarily correlate with the intensity of the pain, a small stone immobilized in the ureter may present with excruciating pain while a large staghorn calculi may be painless or may present with only a dull ache. Uretral stone pain is usually severe, and may radiate to the groin. Abdominal exam may show tenderness as the area around the stone is palpated or percussed. Nausea and vomiting secondary to the pain is not uncommon.

Diagnosis

Radiographs of the abdomen (KUB) may show a stone that is attempting to pass through the ureter. A urinalysis can help diagnosis by confirming hematuria. Though pain may radiate to the groin, exam of

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the genitalia is negative. A pelvic exam and a pregnancy test should be done to rule out the possibility of an ectopic pregnancy.

An intravenous pyelogram (IVP) is the "gold standard" for the diagnosis of renal and/or uretral calculi. On occasion, a stone has passed spontaneously during an IVP because of the osmotic diuresis induced by the contrast material. When contrast media are contraindicated, ultrasound is a valuable alternatives(4).

Management

Pain control is the first step in managing the patient with the sudden onset of acute renal colic. Acetaminophen with codeine (Tylenol #4, 2 tablets every 3 to 4 hours) or acetaminophen with hydrocodone (Vicodin HP, 1 tablet every 4 hours [up to 6 every 24 hours]) can be used to manage pain. For those patient with no choice but to continue working and who cannot afford the mental clouding that is associated with narcotics, a combination of ketorolac (Toradol, 10 mg 3 times a day) in combination with phenazopyridine HCl (Pyridium, 200 mg 3 times a day) for up to 5 days may be appropriate. The patient should drink 2 to 3 liters of fluid per day to encourage the passage of the stone. The urine should be filtered to capture any stone material so the material can be analyzed.

Patients with nausea and vomiting who cannot tolerate oral rehydration and oral analgesics should be hospitalized. Urgent urological consultation is indicated when fever suggests infection of an ob-

structed kidney or intravenous pyelography shows a nonfunctioning kidney (completely obstructed ureter), a partially obstructed ureter in a patient with only one kidney, or urine extravasation(1).

In 1997, the American Urological Association convened the Ureteral Stones Clinical Guidelines Panel to analyze the literature regarding available methods for treating ureteral calculi and to make policy recommendation based on the treatment outcomes data. The panel recommended that stones lodged in the ureter that are not causing excruciating pain be initially managed by observation. More aggressive treatment approaches - shock wave lithotripsy (the use of a high-pressure shock wave to fragment the stone), ureteroscopy (the use of a fiberoptic endoscope inserted through the urethra into the ureter to find the stone so it can be manipulated and fragmented), and percutaneous nephrolithotomy (removal of the stone through a port created by puncturing the kidney through the skin) -were deemed appropriate for patients with larger stones or severe symptoms. Smaller stones were those defined as less than 5 mm.

For more aggressive therapies, the panel recommended:

- For stones less than 1 cm lodged in the upper ureter, shock wave lithotripsy was recommended as the first-line treatment option for most patients.
- For stones greater than 1 cm lodged in the upper ureter, shock wave lithotripsy,



1. Large staghorn calculi in left kidney.



2. Remaining fragments after ESWL. Note double-J stent.



3. Second ESWL 10 months later. Note improved placement of double-J stent.

percutaneous nephrolithotomy, and ureteroscopy were all deemed acceptable treatment choices.

- For all stones lodged in the lower ureter, the panel recommended both shockwave lithotripsy and ureteroscopy as acceptable treatment choices.

Before or after lithotripsy, a stent may be inserted (see photos) to allow urine to flow freely without interference by gravel formed from the fragmented stone. Though stenting may be used along with lithotripsy, the panel recommended against the practice of routinely using a stent along with lithotripsy because the published data shows no improved fragmentation with stenting (health care providers can order a copy of the AUA's *Report on the Management of Ureteral Calculi* by contacting the American Urological Association Health Policy Department at 410.468.1800). It must be kept in mind, however, that, among urologists, there is a greater diversity of opinions in the treatment of stones than in any other part of urology, report notwithstanding.



A. Pre-op film; note stone at left ureterovesical junction.



B. Forty-five minutes after injection of contrast material. Note massively dilated left ureter and enlarged left kidney - all usually due to long-standing blockage. Densities in left kidneys are not stones; these are areas where contrast material has pooled in dilated renal calyces.



C. Post-op stone manipulation. Properly placed stent allows urine to pass through unimpeded by swollen ureter or by blockage by other stones. This gives the ureter time to heal.

Prevention of Calculi

Water intake must be increased to form at least 2 to 3 liters of urine per day. After the stone has passed, a metabolic workup should be considered, as well as an analysis of the stone. For calcium stone farmers, an initial 24-hour urine should be tested for calcium, uric acid, oxalate, citrate, sodium, volume, and pH. Hypercalciuria is the most common abnormality; future stones may be prevented by starting the patient on a thiazide diuretic (25 mg a day). Acetohydroxamic acid (AMA) is used as a prophylaxis after struvite stones are diagnosed; a typical dose is one 250 mg tablet 3 to 4 times a day. Side effects can include headaches (responsive to aspirin compounds), nausea, vomiting, anorexia, and depression. Penicillamine, 250 mg daily in 3 or 4 divided doses, can be used for cystine calculi. Penicillamine increases the requirement of pyridoxine (vitamin B6) which should be supplemented with 25 to 50 mg a day(2).

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The Use of Exhaled Carbon Monoxide for the Diagnosis of Carbon Monoxide Poisoning

A Case Report

Wayne Wallace BA RRT

ABSTRACT

Introduction: Carbon monoxide (CO) poisoning is difficult to confirm in small rural hospitals that lack easy access to a cooximeter. A small hand held device can be used to assess exhaled CO (ECO) in parts per million. This device is often used in smoking cessation clinics to confirm that a person has abstained from smoking.

Case Summary: A 47-year-old white male became dizzy and had a near syncopal episode while working on his boat in the local marina. He was brought to the ER and was found to have an exhaled CO level of 180 ppm. The presence carboxyhemoglobin (HbCO) was confirmed later by an independent reference laboratory and the result was 26% HbCO.

Discussion: The patient's exhaled CO level dropped slower than expected while breathing oxygen delivered by a non-rebreather mask. This could be due to inadequate compliance to oxygen therapy and a FiO_2 somewhat less than 1.0. Another limitation of the technique is the calibration gas (50-ppm CO). This concentration may be too low to assess ER patients. Therefore a confirmatory ABG with coximetry should be obtained if available. Clinicians are cautioned that there is no safe level of HbCO (6). There is a simple formula to convert ECO to HbCO. The use of exhaled CO monitoring may be a promising alternative that is relatively less expensive than coximetry in the ER setting, but more research is clearly indicated.

INTRODUCTION

The diagnosis of carbon monoxide (CO) poisoning can be problematic in small or rural acute care hospital due to the lack of a cooximeter. CO poisoning is caused by inhaling CO usually in an enclosed space e.g. the inhalation of vehicle exhaust or in conjunction with smoke inhalation in a fire. The CO crosses the alveolar capillary membrane and binds directly to the hemoglobin with almost 245 times the affinity of oxygen. The combination of CO and hemoglobin is carboxyhemoglobin (HbCO) and this abnormal form of hemoglobin can not deliver oxygen to the victim's tissue beds (2). The symptoms are proportional to amount of hemoglobin bound by CO (see table 1). Unfortunately, the symptoms for CO are similar to a variety of other conditions. The most common treatment is to have the patient breath 100% oxygen which displaces the CO off the hemoglobin. The reason that oxygen is an effective treatment for CO poisoning is that it reduces the half life of HbCO from 5 hours and 20 minutes (breathing room air) to 1 hour and 20 minutes (breathing 100% oxygen). There is also a small beneficial effect from increasing the amount of dissolved oxygen in the plasma. Finally, the half-life of HbCO can be reduced to only 23 minutes in a hyperbaric chamber and therefore hyperbaric oxygen should be used if available in the treatment of CO poisoning (3).

The emergency room physician's index of suspicion for CO poisoning is usually guided solely by history. The patient will relate a story about being near combustion source in a confined place when the

Table 1.

Symptoms of acute Carbon Monoxide Poisoning*

HbCO level (%)	Symptoms
10-20	Asymptomatic or headache
20-30	Dizziness
30-40	Visual Disturbances
40-50	Confusion, syncope
50-100	Seizures, coma, cardiopulmonary failure, death

* based on level of carboxyhemoglobin adapted from Carbon Monoxide Poisoning, An Occult Epidemic by Sadovnikoff, Varon, and Sternbach (4).

symptoms began. At other times, the patients will not realize the cause of their symptoms. This is true in patients who have been chronically exposed to CO over a long period of time. Often, the physician will have a blood sample sent to an off-site reference laboratory to test for HbCO. However, the result might not be known for 1-2 days in a remote hospital. Obviously, a simple low cost test that could be performed at the point of care would be valuable in making a differential diagnosis.

A device that is normally used for smoking cessation classes can be used for the detection of CO poisoning in the ER or elsewhere. The unit measures CO gas (in parts per million) passively exhaled by the patient. The device uses an electrochemical method for measuring CO and is capable of covering the full range of values needed to assess patients (if properly calibrated). The patient passively exhales through a series of one way valves for between 1-2 minutes. The patient's exhaled gases are trapped between the one way valves and are thus exposed to the device's CO sensor. Most of meters on the market today display exhaled CO level from 0-999 parts per million and are most accurate to +/- 2 parts per million CO. They are calibrated by using a gas that has 50 ppm of CO. The HbCO relates to Exhaled Carbon Monoxide (ECO) via the following formula (5):

$$\text{HbCO} = 0.63 + .16\text{ECO}$$

Formula 1. Relationship of HbCO to ECO

The devices cost between \$1,000-2,000 and require little maintenance versus the cost of a cooximeter, which is between \$11,000-16,000 and is much more difficult to maintain. Finally, most of the ECO meters can also be used to test room air for CO.

Case Summary

A 47-year-old white male was working inside the fuel hold of his boat. There was a gasoline-powered generator running on the deck. After a period of several hours, the man began to feel groggy and dizzy but denied having chest pain. He was observed having a near syncopal episode on the outside of the boat and was brought to the ER for treatment. Upon arrival at the ER, his vital signs included respiratory rate 20/min, blood pressure 140/83 temperature was 37 degrees C and the pulse was 82 beats per minute. The EKG showed normal sinus rhythm and the SpO2 was 99% on room air. A blood sample was

drawn and sent to a reference lab for determination of HbCO and at the same time the ECO level was measured using an ECO meter. The ECO was 180 ppm and this correlated to 26% carboxyhemoglobin level (measured by the reference laboratory). This value was known 4 days after the event had occurred.

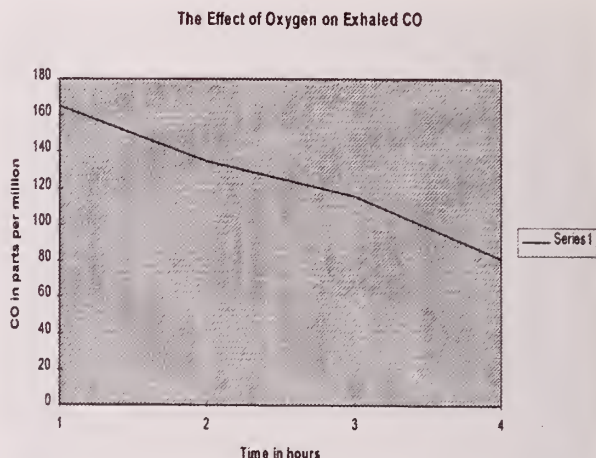


Figure 1. Patient on 10 liter per minute non-rebreather

The patient's ABG results on a 10-liter per minute non-rebreather were pH 7.48, PaCO2 34 torr, and PaO2 189 torr. After approximately 5 hours of oxygen therapy, the patient no longer felt dizzy and the exhaled CO level had fallen to 49 PPM (not shown on the graph). The patient was discharged at that point.

DISCUSSION

The patient's ABG was relatively normal and the SpO2 was 99% on room air. The use of ABGs and SpO2 can be very misleading in CO poisoning as demonstrated in this case with over 25% of the patient's hemoglobin bound with CO instead of oxygen (note the benign ABG result and SpO2 measurement). The patient's ECO level did not drop at the rate expected while on oxygen and this is probably due to several factors. First, non-rebreather masks do not deliver 1.0 FiO2. Second, the patient was not on oxygen during the whole period. The patient took the mask off when going to the bathroom or speaking with the physician. The EKG showed no ischemic changes and the vital signs were unremarkable. The formula predicts that the patient's HbCO should be 29%. However, the result from the reference lab recorded a value of only 26% HbCO. It is difficult to assess what caused this small measurement error. One possible source of error may be the calibration gas. Currently, the only

calibration gas concentration available from the manufacturer is 50 ppm CO and this may not be high enough to assess patients in the ER. It is remarkable the predicted value was so close to the actual value with the patient's ECO was over 3 times the device's calibration range. It would be beneficial to have a controlled study in which a series of simultaneous HbCO and ECO measurements were made. It is possible to construct a new table that relates HbCO, ECO and symptoms (most clinicians are much more comfortable dealing with HbCO as opposed to ECO). However, clinicians are cautioned that there is no safe level carbon monoxide (6). Delayed Neuropsychologic Sequelae (DNS) like (headache, difficulty concentrating, lethargy, emotional lability, amnesic syndromes, dementia, psychosis, parkinsonism, chorea, apraxia, agnosia, peripheral neuropathy, and urinary incontinence) may occur at relatively low levels of carboxyhemoglobin (6). Thom et al recommends treating patients with carbon monoxide poisoning with hyperbaric oxygen to prevent DNS (6). Finally, clinicians who opt to use exhaled carbon monoxide should draw a confirmatory arterial blood gas with cooximetry if it is available at their institution.

Equipment used:

BreathCO Vitalograph Corporation Lenexa, Kansas

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HbCO level (%)	ECO in parts per million	Symptoms
10-20	59-121	Asymptomatic or headache
20-30	121-184	Dizziness, nausea, dyspnea
30-40	184-246	Visual Disturbances
40-50	246-309	Confusion, syncope
50-100	309-621	Seizures, coma, cardiopulmonary failure, death

Table 2. The relationship between HbCO, Exhaled Carbon Monoxide, and symptoms. (ECO values derived from formula 1)

The Centers for Disease report that CO is the most common cause of death by poisoning killing estimated 3500 individuals per year (1). Mariners are especially prone to CO poisoning and many do not have CO detectors on their vessel (7). Accidental CO poisoning's symptoms (dizziness, fainting, short of breath, headache, or chest pain) are similar to many conditions like seasickness, heart disease, stroke, flu, or pulmonary disease which can make the differential diagnosis difficult. This case study describes a typical encounter with CO poisoning that took place in a small rural hospital. The use of exhaled CO measurements allowed for straightforward treatment of the patient in this case study. However, further research should be directed at using ECO in the ER setting.

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Rescue on Ptarmigan Peak

by Ken Zafren, MD

"In memory of Steven Brown and Mary Ellen Fogerty"

The pager went off at 5:30 PM on the 29th of June, which was a very inconvenient time. This is as normal for mountain rescue calls as it is for medical emergencies. Chris and I were about to sit down to an anniversary dinner at home, since it was too nice a day to eat in a restaurant. The call was for a fallen climber on Ptarmigan Peak. Anticipating a long, technical rescue, I left the house with trepidation, not because of the rescue but because of the near certainty of lost sleep. I had to be in the Emergency Department at 7:00 the next morning. On the other hand, during nice summer Sundays, many members of the Alaska Mountain Rescue Group (AMRG) are out on their own adventures. As a rescue qualified member, I would probably be needed.

The Providence LifeGuard helicopter was already flying by the scene when I arrived at the Glen Alps parking lot. They couldn't land, but at least they had located the victims of whom there were now thought to be eight or more with two fatalities. The Glen Alps parking lot was the command post and staging area. Anchorage Fire Department paramedics were already there.

Bruce McCormick, the AMRG Incident Commander made sure that I would be first into the scene. The Alaska State Trooper helicopter (Helo 1), with pilot Bob Larsen was waiting for us. Chris Flowers and I loaded ourselves, our rescue packs, two body bags, and a number of snow pickets into the chopper. Moments later we were directed to the victims by another AMRG member, Scott Horacek who had reached the area on the ground and was still below them. Bob put us down with a toe-in landing on a ledge about 500 feet horizontally from the scene. He asked us to be careful getting out of the helicopter.

After Helo 1 departed, Chris and I found ourselves on a ledge big enough for two people and a helicopter. We downclimbed some easy rock bands, traversed sloping ledges to the couloir and crossed a snow slope to the victims. The scene that greeted us was surreal. Twelve victims were under sleeping bags and space blankets. There were several skiers and mountain

bikers, most dressed very lightly, doing what they could for the victims. Two climbers were dead.

Scott arrived from below at about the same time we reached the site. We did the best we could to start triaging our patients. Loose rock at a steep angle made every movement more difficult. It was hazardous to move above any of the victims, but also unavoidable. As the only doctor on the scene, I tried to begin organizing the medical care and evacuation. It was warm, about 75 F, and still sunny. I arrived still wearing t-shirt, shorts and plastic double boots, but I knew I would be there a while, so I added a pair of wind pants and a pile jacket.

A short while later, the first of two Pavehawk helicopters from the Alaska Air National Guard 210th Pararescue Squadron arrived and hovered over the slope below us. They lowered the first several pararescuers (PJs) to the ground along with backboards, vacuum mattresses and litters. The Pavehawks were to be our supply line in both directions, lowering a total of nine PJs, eleven complete litter and spinal immobilization combinations, and medical supplies while hoisting the patients out and taking them to hospital. Meanwhile, Helo 1 was busy, bringing in two Anchorage Fire Department Paramedics followed by eight more AMRG members.

Jennifer Nelson, the paramedic supervisor, was very concerned about triage, also. She heard there was a doctor on scene, but our departure on Helo 1 had been so sudden, she didn't know who the doctor was. She said that had she realized I was there, she wouldn't have been so assertive about putting her paramedics in the field immediately.

As we pieced the accident together, we were amazed that there were any survivors. Fourteen members of a climbing class had been starting to descend the North Couloir of Ptarmigan Peak when the top rope team slipped and successively brought down all of the other three rope teams. A ball of humanity slid over 1000 feet vertically - much farther as measured over the snow - down the couloir, bouncing on exposed rocks and finally coming

to rest on boulders in an area where the snow had melted out. Fortunately, three skiers were hiking up, hoping to enjoy a late-season run. They saw the accident and ran up to the victims, whom they found in a heap. Some were being asphyxiated by the ropes; some were having problems breathing because of other victims on top of them. The skiers cut the ropes and carefully spread the victims next to each other on the steep slope. One skier ran down for help and intercepted a number of mountain bikers on the trail below. These bystander-rescuers grabbed sleeping bags and warm clothes from the class's camp at the base of the couloir and carried them up to prevent hypothermia.

What can one rescuer do for 12 injured victims? It was clear that my main job would be triage, as there would soon be a large number of paramedics on scene. I quickly talked to all of the patients. All were able to speak, so I knew that they had airways. There were some who were having difficulty breathing, however, mostly due to pain associated with chest injuries, possibly with pneumo- or hemothorax. A few of the patients seemed to have a decreased level of consciousness. It was clear that nonmedical considerations would also determine the order in which we would evacuate the patients. One patient was lying below a precariously balanced large rock which was being supported by one of the bystander-rescuers. Above the rock was one of the more seriously injured patients, but it would be too dangerous to package that patient before the one below was moved.

I reached the scene at 1830 hours, about one hour and twenty minutes after the accident. One of the fatalities had died immediately, the other 20 to 30 minutes after the fall, without regaining consciousness. I reasoned that the rest were destined to be survivors. It was difficult to examine them, under sleeping bags and space blankets. Although the weather was warm, the patients were lying on cool rocks, were in shadow, and were inactive due to their injuries. Hypothermia would soon be a problem, especially with the anticipated rotor wash of hoist extractions. We would have to examine the patients with a minimum of disrobing.

As the PJs arrived, I pointed them to the most severely injured patients. There were too many for one person to keep straight, half hidden as they were under various insulating layers. The two fire department medics and the PJs began assessing the most

critical patients and putting them on Miller boards. Brent Widenhouse, the PJ who was their on-scene commander, handled communications with the Pavehawk helicopters and helped me with triage. As patient conditions changed and as we uncovered various injuries, we constantly revised our planned order of extrication.

One patient, in particular, had me concerned. She clearly was conscious, alert, and having no respiratory difficulties, but she was vocal about not being able to take much more. Conventional wisdom told me that she was one of the more stable patients, but her distress increased my concern for her. As soon as we had enough paramedics to work on those with breathing problems, I asked one of the PJs to look at her. She had a shoulder injury and an open femur fracture. Stabilizing her for transport took some time, but with the help of a vacuum mattress, we were able to make her more comfortable and stabilize her injuries adequately.

One by one, we put the patients on backboards or on vacuum mattresses and then in litters. Each time we had two patients ready, Brent would call for the Pavehawk which was waiting at the base of the couloir and it would come up to hoist them out. Even though the helicopter was working at the limit of the 200 foot hoist lines, the rotor wash was tremendous. Little else could be done during the hoisting. All available rescuers would hold blankets and sleeping bags over the remaining patients. Several unsecured objects blew away at these times and tumbled down the slope.

Finally, at 2345 hours, the last patient was hoisted out. Remembering my early appointment with the Emergency Department, I descended the slope to Helo 1, along with three other rescuers who also had to be at work in the morning. Bob flew us back to the parking lot, where I was debriefed and where the Red Cross fed me a sandwich. I was home in bed by 0130 and slept well.

The aftermath of the accident continues. The dead are buried and the living are walking again. Several groups have investigated the accident and the Alaska Wilderness Studies Program. I have written a report for Accidents in North American Mountaineering and, along with all the other rescuers, I have received an award from Governor Tony Knowles. None of us, victim or rescuer, will ever be quite the same. To the families and friends of Steven Brown and Mary Ellen Fogarty, who were killed in the fall, I would like to extend my deepest sympathy.

Application for Membership

in the

**Alaska State Medical Association
4107 Laurel Street
Anchorage, Alaska 99508**

Date of Application _____

I am applying for membership in the Alaska State Medical Association as a ☐ Regular ☐ Associate
☐ Institutional ☐ Student member, and for membership in the:

- | | |
|--|---|
| <input type="checkbox"/> Anchorage Medical Society | <input type="checkbox"/> Ketchikan Medical Society |
| <input type="checkbox"/> Fairbanks Medical Association | <input type="checkbox"/> Matanuska-Susitna Medical Society |
| <input type="checkbox"/> Juneau Medical Society | <input type="checkbox"/> Sitka-Mt. Edgecumbe Medical Society |
| <input type="checkbox"/> Kachemak Bay Medical Society | <input type="checkbox"/> There is no local medical society in my area |
| <input type="checkbox"/> Kenai Peninsula Medical Society | |

Full Name _____

Date of Birth _____ Sex _____

Mailing Address _____

City _____ zip _____ Phone # _____

College of Medical Graduation _____ Year _____

AMA Medical Education Number _____

Year of Alaska License _____ Specialty _____

If elected into membership, I agree without reservation to conduct myself professionally and personally according to the Principles of Medical Ethics and to be governed by the Constitution and Bylaws of the Alaska State Medical Association.

Applicant's Signature _____

This application must be signed by two ASMA sponsoring members before submission to the ASMA office!

Sponsoring Members: We, the undersigned sponsors, support this physician's application to membership.

(print name)

(print name)

(signature)

(signature)

Please return this application and membership dues to ASMA, 4107 Laurel Street, Anchorage, AK 99508 (Fax 561-2063).

Medical Malpractice Tort Law - A Benighted System

Rodman Wilson, MD⁽¹⁾

When you go to a doctor's office or to a surgicenter, hospital or nursing home, hundreds, sometimes thousands, of things happen to you. You are talked at, stroked, poked, bled, given potent drugs, perhaps even put to sleep and cut wide open, and at the end, likely as not, pushed, still wobbly out the door.

Even though the intent of your doctor and others is to get you well, with so much going on, small wonder that something goes wrong from time to time.

Medical care is not like going to the store or to your accountant or lawyer. You are not supposed to be touched by your grocer, accountant or lawyer. In contrast, your doctors, nurses and other health care workers have their hands all over you. There's the rub, literally. And there's the peculiar hazard of medical care: not only is your pocketbook at risk, as in ordinary commerce, but your very body is at risk of physical harm.

A comprehensive Harvard University study published in 1991 demonstrated that in New York State in 1984, 3.7% of hospitalized persons (1 of 27) were injured during the course of medical care and that a quarter of these (1% overall) were injured through carelessness on the part of doctors or others in the large number of hospitals sampled. Approximately one third of injuries were minor and self-limited or easily corrected. Another third recovered within 6

months, though usually with extra hospitalization, expense, and time away from usual pursuits. A final one third of injuries were severe and caused permanent disability or death. Ten percent of all persons injured died. (Brennan TA, Leape LL, Laird N. et al. *Incidence of Adverse Events in Hospitalized Patients*. New England Journal of Medicine 1991;324: 377-384).

Is this distressing? Certainly! Understandable? Yes, in part, considering the complexity of medical care and all the dangerous touching described above. Excusable? Not at all, especially since the aim of all care in a hospital or elsewhere is *perfection* – doing things just right. It is not (as the law has it) serving up “average” care which merely meets the “standard of care” in a particular community.

Surely, one might think, there is provision within our system of medical care with its many marvels for reliable rectification of medical harm. Not so. The ways in which we try to put patients and their lives back together again after injury at the hands of medical care are more haphazard even than our comminuted system of getting care in the first place.

A few physicians and hospitals forgo further charges after a medical injury, at least for the extra expenses arising from the injury. But mostly the system says, in effect, “If you think it's the doctor's or hospital's fault, go get a lawyer and make a claim or sue.” One might well add, “and be prepared to wait several years for resolution of the matter.”

You don't have to look far for a personal injury lawyer. Their garrish ads jump from the yellow pages, billboards and airwaves. But be warned! This does not mean that an attorney will take your case. It has to be close to air-tight, and there has to be a lot of money in it. As one Anchorage trial attorney said recently, “I don't take a case unless I see \$250,000 when the client comes through the door.” Small

(1) Dr Wilson practiced internal medicine in Anchorage, 1958-82. From 1982-87, he was director of public health for the Municipality of Anchorage. In 1975, he was a member of the Governor's Commission on Medical Malpractice Insurance, in 1996 he was Executive Director of the Alaska State Medical Association and a member of the Governor's Advisory Task Force on Civil Justice Reform.

chance for a person who has “only” \$50,000 in extra medical expenses and lost wages.

Incidentally, this is why few medical malpractice claims involving older persons are filed. Most old people have retired. Life expectancy is short. There are simply not enough present and future losses to entice lawyers. Yet a large portion of the negligent injuries and deaths among patients in the Harvard study cited above involved fragile old folks. They or their survivors simply didn’t sue.

So, it is a system that is enervating, erratic, wasteful and agonizingly slow. Only about 40 cents of the malpractice insurance premium dollar trickles down to injured patients. The rest goes to lawyers and insurance company overhead and profits. It is a system which brings out the worst in both parties – anger, alienation, self-pity, passivity, involution, greed, sophistry, prevarication, betrayal. Only attorneys enjoy it.

In Daniel Defoe’s great English novel, *Moll Flanders*, written in 1683, Moll – robber, pick-pocket, bawd – is accused, falsely for once, of stealing a remnant of satin from a London shop. Moll, ever opportunistic, gets a lawyer and sues the mercer for false arrest. A tort then, a tort now.

After cross accusations, legal sparring, offers of settlement, counteroffers, haggling to make certain that Moll’s attorney will receive his fee, and a final settlement conference, Moll extracts from the shopkeeper £150 (quite enough at that time to live on handsomely for several years), a suit of black clothes, her attorney’s fee, and supper for all including her equally scurrilous “witnesses,” gussied up for the occasion like persons of substance.

American tort law has its origins in English law in the 16th Century and earlier. It has evolved, to be sure, but not much. Moll’s scheming and the connivance of her attorney, albeit fictional, sound all too familiar.

Can’t we do better than this in the 21st Century? Probably not. At least not until we have a comprehensive medical care system which gives everyone the care they need. At that point, it would be constructive to fashion an administrative scheme to deal with instances of injury arising from medical care, whether through someone’s negligence or not. In exchange for giving up the right to sue for the moon, everyone would have access to a timely, reliable mechanism for restoration and recompense.

A major portion of the problem injured patients

have would simply disappear with a system of universal health care, for an injured person would not have unexpected medical bills. It is a deluge of bills that may trigger many malpractice lawsuits in the first place. In addition, there could be awards by schedule for loss of function, loss of body parts, or death. There would also be allowances for lost wages but no payment, as such, for suffering. Pain, missed companionship, lost pleasure and the like are not fungible in any event, any more than love or the enjoyment of alpenglow can be exchanged for goods or money. The victim would bear non-economic damages as a part of the vicissitudes of life.

Such a system would be much like the Worker’s Compensation System, but it should not be allowed to be corrupted, as worker’s compensation has, by permitting “3rd party recovery.” A person injured at work on a forklift cannot sue his or her employer but can bring suit against the manufacturer of the machine by alleging it was faulty. As a part of the price for an efficient, semi-automatic system for restoring and recompensing a person after harm at medical hands, 3rd party claims should not be countenanced.

Would such a device be costly? Yes, it would, but arguably no more so than our present medieval way of seeking justice for negligently injured folk. And it would be far superior in many ways, for it would be even-handed and there would be no delay or question about proceeding forthwith with whatever restorative and rehabilitative care the victim needs and little incentive on the part of the patient not to get well. In sad contrast, with the present protracted tort adjudication system, invalidism is fostered, indeed even coached at times by unscrupulous attorneys.

What about correction or punishment of an offending physician? Punishment now, with rare exception, is only the quarterly or annual malpractice insurance premium the physician is constrained to pay – hardly an appropriate penalty and certainly not tailor-made to fit offenses. Remember, however, that even negligent injuries are almost never the result of deliberate misbehavior. It is not like starting a fight in a bar or speeding on a narrow, wet road. Medical malpractice arises while trying to help someone get well.

Punishment of a caregiver or an institution may not be appropriate at all; but if it is, it should bite. Depending upon the egregiousness of the act or omission, there could be one-time civil fines of

(continued on page 47)

Alaska Mushroom Awareness

Kenneth W. Moss, MD



The king bolete (*Boletus edulis*) is frequently found in Alaska. It is widely used in Europe where it is known as ceps in France, porcini in Italy and steinpilz in Germany.



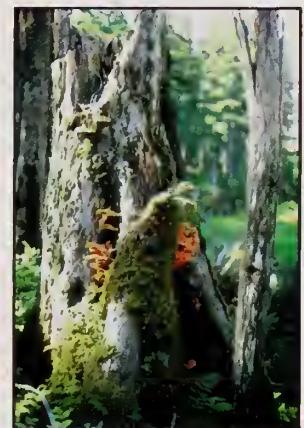
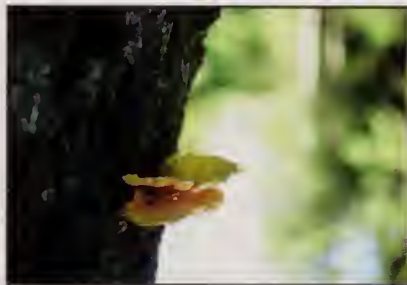
The morel mushroom (*Morchella esculenta*) is a highly prized edible mushroom, appearing in late May or early June in southeast Alaska. It is a harbinger of spring and the only edible mushroom appearing at this time of year.



The shaggy mane mushroom (*Coprinus comatus*) is a beautiful and choice edible of late summer, commonly appearing on roadsides and lawns. It must be picked when young and used and cooked quickly or else it undergoes autolysis.



The pear-shaped puff ball mushroom (*Lycoperdon pyriforme*) and the gem-studded puffball (*Lycoperdon perlatum*) are easy to recognize, choice edibles when picked fresh. Specimens should be cut in half to make sure they are pure white without color change.



The “chicken of the woods” or sulfur shelf mushroom (*Laetiporus sulphureus*) is a beautiful edible mushroom which grows on dead logs or stumps and appears in August.

Over 500 species of mushrooms grow in Alaska; many are edible, a few others are inedible, dangerous or poisonous. The amateur mushroom hunter of Alaska has an abundance to collect, whether for cooking or simply to delight in the collection.

Numerous mushroom hunting guides are available for the western United States and some specifically for Alaska. These reference books are useful to the hunter for identification, including for mushroom cookery. Though the most poisonous varieties

of *Amanita* do not occur to any extent in Alaska, some species are toxic enough to cause illness and the medical practitioner may at times be called upon to utilize the reference guides or to call a poison control center.

C.M. Christensen named the “fool proof four” in the 1940’s - the morel, the “chicken of the woods” mushroom, the puff ball and the shaggy mane mushroom. These are shown above, as well as another choice edible, the king bolete.

GOOD DOCUMENTATION PROTECTS PATIENTS AND PHYSICIANS, MIEC SAYS

Physicians can lose many medically defensible malpractice claims because of the poor quality of their medical records – even when their medical care is appropriate. So says Medical Insurance Exchange of California, California's first physician-owned professional liability insurance company and the ASMA-sponsored carrier. David Karp, MIEC's Loss Prevention Manager, explains, "Medical records often are the most important objective evidence physicians and hospitals can offer in their defense against a malpractice claim. When jurors, arbitrators, pre-litigation screening panels or other triers of the facts must choose between conflicting, undocumented versions of events told by opposing parties, the documentation that was made at the time care was rendered is a defendant's most decisive confirmation that he or she met accepted standards of medical practice. Disorganized, incomplete medical records make it difficult to determine whether an adverse outcome resulted from appropriate or negligent medical care."

MIEC has just produced a new handbook – *Medical Record Documentation for Patient Safety and Physician Defensibility* – that explains how physicians can keep defensible medical records and avoid documentation deficiencies. It's free to MIEC policyholders and includes Category 1 CME credits. Cost to nonpolicyholders, including tax and shipping: \$40 for textbook only, \$125 for the textbook with CME credits.

For an order form, call MIEC's Loss Prevention Department, 800-227-4527, extension 3337. MIEC policyholders may also order their free copy on-line from MIEC's website, www.miec.com.

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Editorial. . .

The springtime chinook winds have returned to the Chugach Mountains and the winds of change which now are a constant factor are picking up momentum in our medical, economic and social lives. From the day-to-day patient care issues of providing new therapies and incorporating innovative technologies and medications we are faced with information hungry patients seeking the latest and greatest. These new age folks arrive armed with the latest internet information and demand that the envelope be pushed either here in our statewide medical system, or outside, thereby bypassing out Alaskan expertise. We have some exceptional opportunities immediately before us to take advantage of. Alaska has been selected by Medicare as one of the five target states to establish a model for demonstration and creation of a telemedicine system. We stand to reap the benefits of advancing the access of rural Alaskans to state of the art diagnostic and therapeutic medical services. These can be directed by medical center bases either within our state or in the lower forty eight. The potential gain or loss for our system is substantial from two aspects: 1) the bypass of patient control from our own local specialty services at a time of increasing numbers of available physicians within our state medical community, 2) loss of control locally of our traditional referral sources and direction of that control by outside entities. Insurance company directors, hungry outside medical centers, and federal agencies will all be competing heavily for this information system and ultimately the management of our traditional patient population. We need to be aware of these changes and express our concerns and give input to those involved especially at our own regional medical centers. Every effort to support the establish-

ment of full resources here and the distribution of information regarding these services, and incorporating these into the mix on a prioritized basis is key in my mind to creating a mutually beneficial system. I encourage all to contact each of our administrations and locate those involved in making these telemedicine decisions. We all need to be expressing our concerns and requesting our preferences be addressed in the establishment of these services. Federal, state, and private facilities are all part of this picture and should command a say in being part of our future system.

We are also initiating a new Socioeconomic Forum section with this issue and request that timely issues effecting the present and future practice of medicine in our state be presented. We will try to function as a sounding board for our members and become another avenue of exchange of opinion.

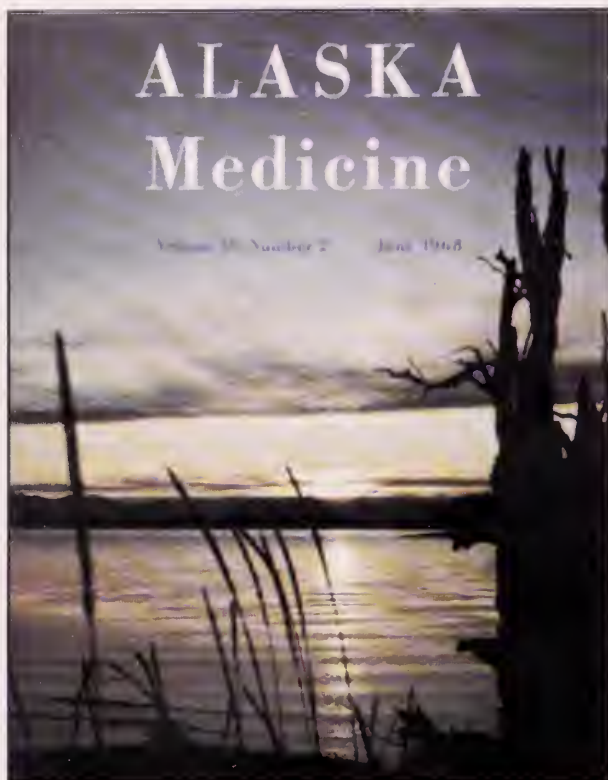
I would make a plea to all readers to please consider contributions to your medical journal. We have the wonderful luxury of access to publication and distribution not only locally but literally worldwide. We strongly encourage you all to contribute. We would especially encourage those involved with our training programs to consider involving our residents and students in presenting timely medical articles in our medical journal.

We have a broad selection of papers, opinions and experiences. I thank our contributing authors and wish for all our readers a wonderful Alaskan summer!

Bill Clark,
Editor

From Out of the Past — Thirty Years Ago...

Gloria K. Park, MD ⁽¹⁾



Volume 10, Number 2

June 1968



Volume 10, Number 4

December 1968



Skin lesion of Orf, photographed 21 days after patient had scratched the hand in stalking, dressing and skinning Alaskan mountain goats.

Excerpts from 1968 issues of Alaska Medicine:
**A CASE OF ORF (*Ecthyma contagiosum*;
Contagious Pustular Dermatitis)
CONTRACTED BY A HUMAN FROM A WILD
ALASKAN MOUNTAIN GOAT**

by Ralph W. Carr, M.D., F.I.C.S.

Introduction

A new case of this viral disease has been seen, is believed to be the first reported from Alaska, and, as far as this author has read, is the first case reported as contracted by a human from a wild animal.

Description

Ecthyma contagiosum, orf, or contagious pustular dermatitis, is a world-wide viral infection of sheep and goats, that is occasionally secondarily transmitted to the skin of man.

The word 'orf' is of great antiquity, and thought to be derived from the Old English or Saxon word *hreoƿ*: rough, scabby.

The oral mucosa of sheep and lambs is most commonly affected, though spread may occur to other mucosal surfaces and the skin. Goats also develop the disease. In man orf is considered rare. Usually the infected person has not been exposed previously to infected animals or their carcasses, and has been working with them only two to three weeks. It is thought that for human skin to be infected it is necessary for a scratch or abrasion to be present.

MEDICAL BRIEFS

LONG TERM CURE OF A WILM'S TUMOR

By George Hale, M.D., F.A.C.S.

A recent wedding announcement in the newspapers with the picture of a very attractive young woman, now a college senior, reminded me of a pretty four year old girl seen sixteen years ago with a large mass filling the left side of her abdomen.

On 6-27-51, she underwent a left abdominal exploration and nephrectomy without intraperitoneal spill. There was no evidence of metastasis at surgery. The tumor measured 13 x 8 x 4 cm and appeared largely external to the kidney.

Final diagnosis was adenomyosarcoma of kidney (Wilm's Tumor) with negative nodes.

She was discharged on the seventh post-operative day and referred to Seattle for x-ray therapy, where she received 2000 R anteriorly and 2000 R posteriorly (through 15 x 15 cm ports at 400 KV, alternating anterior and posterior fields at the rate of 200 R per day) to the left renal bed and its lymph drainage area.

As far as I have been able to determine, this is the first successful long term cure of Wilm's Tumor in Alaska.

ULCEROGENIC TUMOR, A CASE REPORT

By Robert S. Smalley M.D.
and Henry Wilde M.D.

Our patient presented with a four year history of intractable ulcer disease with a large volume of gastric secretion. This led to occasional vomiting of copious quantities of gastric juice suggesting partial pyloric obstruction. He was submitted to subtotal gastrectomy and the islet cell carcinoma metastasis was found incidentally. Removal of the metastatic node resulted in an apparent cure.

We feel that it is quite possible that the primary carcinoma in our patient was within the wall of the

duodenum even though repeat examination of the surgical specimen failed to demonstrate the lesion.

The patient made a complete recovery and is asymptomatic four years later.

HEALTH OF ALASKA NATIVE CHILDREN

By J. Kenneth Fleshman, M.D.

Chief, Pediatric Service
Alaska Native Medical Center, Anchorage

It has been traditional to evaluate the level of health of a population by the health of its infants and children. This report documents the progress that has been made in improving the health of the Alaska Native children but also points out the discrepancies that still exist in this group compared with the general U.S. The Alaska Native population is now estimated at near 48,000. Approximately one half of the population is in the pediatric age group, that is, below 15 years of age.

Table 1.

INFANT MORTALITY RATE
(Deaths Per 1,000 Live Births)

	Alaska Native	U.S. (All Races)
1950	100.4	29.2
1960	74.8	26.0
1966	52.5	23.4

The success of the tuberculosis control program demonstrates what can be achieved through a well designed cooperative State Health Department-USPHS program. The overall Native case rates have dropped from 588.8/100,000 in 1958 to 166.7 in 1967. The Native tuberculosis death rate of 53.8/100,000 in 1958 will be approximately 8/100,000 in 1967 with all of these deaths being due to the late effects of tuberculosis and none being due to uncontrolled bacterial activity. In 1950 the tuberculosis death rate in Native children under the age of 14 was 100 times the national average for that age group. Only one childhood death due to tuberculosis (meningitis) has occurred in the past two years. The best indicator of the lack of new infections is the rate of positive tuberculin reactions. In 1957 80% of the children entering school in western Alaska were positive, whereas in 1967 only 3.7% were reactors.

DROWNINGS INCREASE

Alaska, with its "longest coastline in the nation", its thousands of miles of rivers, and countless inland lakes, has a higher rate of deaths by drowning than

any other part of the country.

The average rate of deaths from this cause for 1962-66 in Alaska was 21.5 per 100,000 as compared with the national rate of 0.8 per 100,000, according to the Bureau of Vital Statistics. The figures include all ages and all races. The rate for Alaska's native peoples was 51.6 as compared with 15.1 per 100,000 for the white population. In addition, the rate of drownings in Alaska not connected with boating was 11.5 per 100,000 for the same period. The native rate was 34.8 and the white rate was 5.9. The U.S. rate for all races was 2.8.

A compilation by the Injury Control Program, U.S. Public Health & Service Region Nine, quoted the Metropolitan Life Insurance Company Statistical Bulletin for June, 1967 as follows:

"About four fifths of all fatalities in water transportation accidents, numbering some 1,200 a year, result from drownings involving small boats-watercraft propelled by a small motor or sail, a paddle, or oars, and with a passenger capacity of less than 10. About an additional 100 deaths annually are attributed to drownings associated with larger watercraft. The remaining deaths-about one percent of the total-result largely from falls, explosions and fires, machinery accidents, and asphyxiation by gas while in a boat.

EPIZOOTIC OF RABIES IN ALASKA

A growing epizootic of wildlife rabies in and around the Northwestern area of Alaska with irregular distribution over other parts was reported for the first quarter of 1968 by the state Public Health Laboratories branch. A total of 18 cases of rabies had been confirmed as of March 31. Red fox accounted for 11 of the cases, Arctic fox for 6 and a dog for 1 case.

The fox remains the primary reservoir of rabies virus in Alaska, the report stated. Outbreaks of the disease were reported this year at Barrow, Kotzebue, Scammon Bay, Nome, Ambler and Wales. No human cases were reported among the persons bitten. No human rabies deaths have occurred in Alaska since 1945.

According to Surgeon General William H. Stewart of the U. S. Public Health Service, 1967 was the first year the United States has been free of human deaths from rabies originating within its borders. He also commented concerning the large numbers of laboratory-confirmed animal cases in the nation during 1967 and that an estimated 30,000 people were treated for rabies exposure.

SELECTIVE RENAL ARTERIOGRAPHY

By James W. Coin, M.D.

Recent progress in the precise diagnosis of disorders of the urinary tract has been little short of phenomenal. The most precise of these diagnostic procedures is undoubtedly selective renal arteriography. Selective renal arteriography is the roentgen demonstration of the arterial tree of the kidney, including vessels as small as the interlobular arteries. The diffuse opacification of the renal parenchyma during filling of arterioles and capillaries, known as the nephrogram, is also included in the definition. The selective arteriogram avoids confusion of renal arteries with superimposed non-renal vessels as can occur during abdominal aortography. It should be noted that Billy P. Sammons, M.D. introduced this procedure in Alaska in 1961.

RECURRING URINARY TRACT INFECTIONS IN INFANTS AND CHILDREN A Somewhat Distilled Approach

By John Tower, M.D.

Mulling over the recollections of some 13 years of private pediatric practice bring me to the conclusion that the pleasures to be had in this particular field of endeavor are very much akin to those enjoyed by the capable fisherman who anticipates the eager grayling or lively rainbow concealed beneath every placid and harmless pool along the stream.

The hallmark of good work in this field certainly is undue suspicion. My practice was established before I was fully cognizant of how much undetected urinary tract infection lurked inside the children brought in for routine well-infant and well-child checkups.

THE UROLOGIST AND PEDIATRIC URINARY TRACT INFECTIONS

By Alistair Chalmers, I.D.

Common presenting symptoms include: frequency, urgency, dysuria, enuresis and hematuria. Other members of the family may complain of the patient's offensive urinary odor. The child may have an unexplained high fever or may just appear unwell with malaise and anorexia. Most commonly there are few if any complaints and routine urinalysis reveals pyuria or bacteriuria.

It is often impossible to find a satisfactory explanation for a urinary tract infection. However,

recently with the aid of new radiological techniques, the concept of "hydroflux" as a disease entity has evolved. This disorder is always due to a damaged uretero-vesical valve.

VOIDING CYSTOURETHROGRAPHY

By Bruce C. Wright, M.D.

At the Providence Hospital voiding cystourethrograms are done utilizing multiple spot films with standard image intensifier. The bladder is filled in a retrograde fashion via indwelling Foley catheter and spot films made of the filled bladder in AP and both obliques. Reflux is frequently observed at the fluoroscopic screen during filling phase of the bladder and appropriate spot films are made at that time.

Upon removal of the Foley catheter, the patient usually voids promptly and six to eight spot films are made during the course of micturition; with the urethra, base of bladder, and reflux if any demonstrated to good advantage. While cine is of definite aid in voiding studies, it is by no means essential.

\$10,000, \$20,000 or even \$50,000 or more, not awarded to the patient, who is already being taken care of as described above, but paid to the state or health care system. Or, an errant physician, nurse or other caregiver could be required to take specified refresher courses, or suspended from practice for a spell, or, most severe of all, defrocked.

In short, restoration of the patient and correction of the caregiver should be bifurcated and handled by separate agencies

The governor's Task Force on Civil Justice Reform and the legislature labored earnestly and arduously in 1996 and 1997 to refine Alaska tort law. Despite their best efforts, they only tinkered with the hoary status quo. The changes in statutes and court procedures embodied in HB 58 and signed into law by Governor Knowles in May 1997 did little to make adjudication fairer, quicker, or cheaper.

Surely, for modern times we need new ways to handle old issues. We should not continue a system to redress wrong little advanced from the days of Moll Flanders hundreds of years ago. It was ludicrous then and it is ludicrous now.

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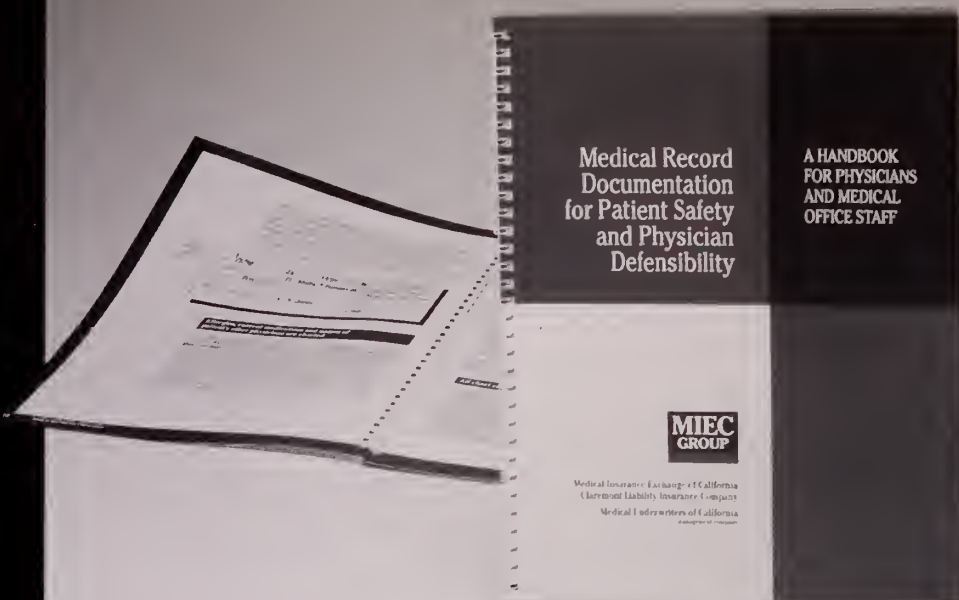
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Angiotensin Converting Enzyme Inhibitors by *Mary Ellen Gordian, MD, MPH*
Cold Stress Reverse T₃ and Lymphocyte Function by *Percival McCormack, MD, PhD*



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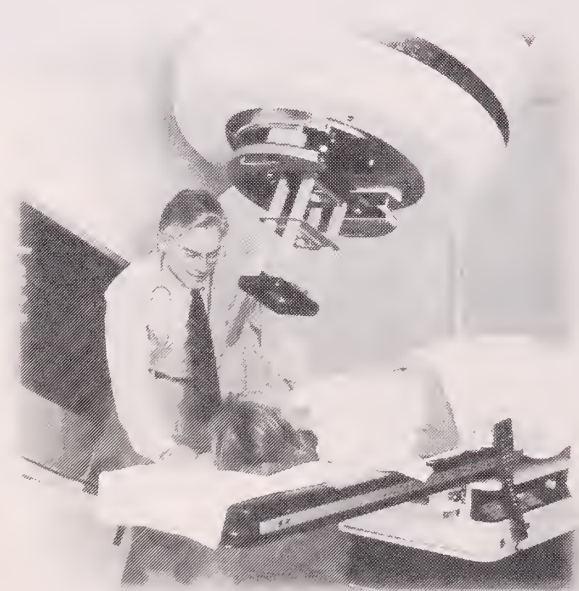
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Why Patients with Diabetes, Hypertension and/or Proteinuria are NOT on Angiotensin Converting Enzyme Inhibitors

Mary Ellen Gordian, MD, MPH⁽¹⁾

Jane Kelly, MD⁽²⁾

INTRODUCTION

Angiotensin Converting Enzyme Inhibitors (ACE-I) have been shown to significantly delay the onset of renal failure in patients with Type I Diabetes who had concurrent hypertension or albuminuria in a large randomized clinical trial (1). The same stabilizing effect has also been shown to benefit patients with Type II diabetes although the evidence is not as strong (2). Renal failure is a serious complication of diabetes. Extending the time to onset of renal failure is a valuable clinical intervention. An audit done in 1997 at the Alaska Native Medical Center (ANMC) identified patients who have diabetes and hypertension or proteinuria (including microalbuminuria) as high risk for renal failure. Despite medical education programs on this topic, only 60% of high risk ANMC diabetic patients are receiving ACE-I. This study was done to determine why such a valuable clinical intervention is not being more widely adopted. The hypothesis of the investigators initiating this study was that the majority of patients not being treated with ACE-I would be found to have had an adverse reaction to the medication. The results were unexpected.

METHODS

The Diabetes Program at ANMC keeps a registry of all patients diagnosed with diabetes within the Native medical system and conducts yearly chart audits to monitor diabetes care (3). A list of patients

with diabetes who receive their care at the Alaska Native Medical Center was generated. Inclusion criteria were a diagnosis of diabetes and at least one of the following:

1. diagnosed hypertension
2. average of the last 3 systolic blood pressure readings ≥ 140
3. average of the last 3 diastolic blood pressure readings ≥ 90
4. proteinuria or microalbuminuria.

Exclusion criteria were a serum creatinine ≥ 3 or potassium ≥ 5 .

The final criterion was that the patient had been identified in the 1997 audit as NOT receiving an ACE-Inhibitor.

An abstraction tool was designed to abstract computerized medical records. The computerized health summary used at ANMC includes the medical reasons for the last 10 outpatient visits, the last five blood pressure readings, and a list of active diagnoses. Laboratory and pharmacy prescriptions filled are also available on the computer. Laboratory results for each patient for the last two years were examined as well as pharmacy records for each patient from 1991 to present.

After the computerized abstraction was completed, patients that had received an ACE-I in the past and were not currently receiving an ACE-I were identified. Charts were requested for manual abstraction if: no reason for stopping the ACE-I had been given in the health summary, the patient had had at least 3 medical visits in 1997, and the patient was not on an Angiotensin Receptor Blocker (ARB). Twelve such charts were manually abstracted. In addition a random sample of 15 charts was requested

(1) Institute for Circumpolar Health Studies, University of Alaska Anchorage

(2) Director of Diabetes Program, Alaska Native Medical Center

for patients who had NEVER received an ACE-I or ARB according to their pharmacy records and who had had at least 3 medical visits in 1997.

RESULTS

A list of 117 patients was generated from the Diabetes audit using the criteria stated above. Two of these did not qualify as having diabetes according to the computerized health summary and laboratory results. One had gestational diabetes only and the second had an episode of glycosuria, with normal glycemia.

One hundred fifteen patients were included in the study of which 55.7% (64/115) were female and 44.3%(51/115) were male. Of the patients identified with diabetes, 71.9%(82/115) had hypertension and 53.1% (53/115) had overt proteinuria or microalbuminuria documented. Six patients (6/115) identified by the 1997 diabetes chart audit did not have the indicators of hypertension or proteinuria noted on the computerized ANMC health summary.

There were four patients who had not had a serum creatinine done within the last two years and six who had not had a serum potassium measured within the last two years. Of those who had had a creatinine measured 12.6%(14/111) had values greater than 1.2. Of those with measured potassium 2.7%(3/109) had potassium greater than 5.0 at the end of 1997. These patients were also excluded.

Chart selection was based upon information obtained from the 1997 diabetes audit. This audit examined diabetes care from June 1996 through June 1997. Charts were selected for study based on the criteria that the patient had NOT received an ACE-I in the past year. According to their pharmacy records 52.6% (60/115) of the patients had received ACE-I at some time. We further found that 26/60 had filled recent (within the last six months) prescriptions for ACE-I. Nine of these 26 were started on ACE Inhibitors after June 1997 and therefore would not have been identified in the audit. The remaining 17/26 had been receiving ACE-I prior to June 1997, and these patients were therefore misclassified on the audit.

There were 34 patients who had received ACE-I in the past but who were not receiving ACE-I at the time of the study. Nine patients had an adverse reaction to ACE-I listed in their health summaries. Of the adverse reactions listed in the health summaries, three were called allergic reactions, three were

cough, two were hyperkalemia, and one was simply listed as intolerance to ACE-I. Five patients were receiving Angiotensin Receptor Blockers. One patient had no medical visits, laboratory reports, or pharmacy reports since 1996 and was presumed to have moved out of the system.

Twelve patients were identified who were eligible to receive ACE-I, who had received ACE I at some time in the last eight years, had had no adverse reactions to ACE-I listed in their health summary, and were not currently receiving ACE-I or ARB. These patients' charts were manually abstracted. The medical record was abstracted from the date of the last prescription for ACE-I in the pharmacy records.

After the manual chart abstraction, two patients were found to have had an adverse reaction, two were non-compliant or refused medication, four had no reason given for stopping the ACE-I and four had other probable reasons in the medical records for not receiving ACE-Inhibitors. The probable reasons were:

- one case of hypotension and acute renal failure from which the patient had recovered;
- one patient diagnosed with lung cancer;
- one patient whose diabetes was being followed by an outside doctor;
- one patient who had been seen for acute care only and had not received any medications since 1996.

Fifty-four patients with diabetes had never received an ACE-I according to their computerized pharmacy records. As stated previously, six of these did not have evidence in the health summary or laboratory reports of either hypertension or proteinuria or microalbuminuria, although evidence for hypertension might have been obtained from manual chart review. Thirty-nine patients were being seen regularly by family practice physicians, internists, or in the diabetic clinic by nurse practitioners and had had three or more clinic visits in 1997. The computerized abstraction of health summary, laboratory and pharmacy records had shown several reasons why a patient might not be considered for ACE-I or ARB. Two patients had concurrent diagnosis of renal failure or renal insufficiency. Two patients had concurrent diagnosis of dementia, two patients were alcohol abusers and non-compliant with medication and two patients had had recent

pregnancy tests.

To find out if chart notes contained information not available in the health summary, a random sample of 15 charts was pulled for manual abstraction. These patients were identified through the computerized health summaries as meeting all criteria for use of ACE-I, had no concurrent diagnoses that would proscribe the use of ACE-I, and had never been given ACE-I.

The abstraction was limited to the last year's visits including all of 1997. From the manual chart abstraction there were several medical conditions that might explain why the provider had not considered starting ACE-I. These included severe alcohol and drug addiction, medications refusal, and female patient trying to conceive. One patient was seen for episodic acute care only and had not attended a follow-up visit despite letters requesting him to do so. Nine patient charts were manually abstracted where patients were seen regularly and appeared to have no reason not to be receiving ACE-I or ARB. This represents 60% (9/15) of the abstracted charts for this group. Several of these patients had concurrent diagnoses of coronary artery disease, and congestive heart failure, which could be additional indications for ACE-inhibitors.

DISCUSSION

The results did not confirm the hypothesis. At ANMC the majority of diabetic patients with hypertension or proteinuria and no contraindications who are not on ACE-I, have NEVER been tried on ACE-I. This confirms the findings that continuing medical education is necessary but insufficient for assuring preventive practice (4). Health care providers are not recognizing the status of the patient. All kinds of providers including those who were known to be knowledgeable about the value of ACE-I in renal protection were not prescribing ACE-I for their patients. The patient encounter allows for the exchange of a great deal of information. Providers may not be thinking of renal protection if the encounter generates questions of a different nature. Patient care might be improved with reminders. Perhaps getting the information directly to patients who could cue their health care provider by asking about ways to preserve renal function might improve compliance.

It is sometimes difficult to determine from chart abstraction why something is NOT being done; however, this study suggests several reasons why

ACE-I or ARB are not being prescribed for patients who might benefit from them. Medical conditions explained the non-use of ACE-I in some cases, and 23% of patients were actually misclassified as not being on ACE-I in the audit when they were receiving prescriptions for ACE-I.

This high rate of medication misclassifications can be attributed to the audit method. Audit inaccuracies could have occurred when information was taken from the chart notes only, and the computerized Pharmacy records were not consulted. Prescriptions from clinics outside ANMC are not always recorded in the chart.

Of the patients who had taken ACE-I in the past, the most common single reason for stopping was an adverse reaction. The most common adverse reaction was cough, which was mentioned seven times. In two manually abstracted charts, the cough was noted to be productive in patients who had been on the medication for years without cough. No attempt was made to restart the medication when the cough subsided or to switch the patient to ARB. Almost 20% of patients for whom ACE-I was discontinued had no reason given in the medical record. These cases were often patients moving from one service to another for their care. Medications were discontinued when there was a break in primary care, such as patients being referred and followed by subspecialty services.

CONCLUSIONS

Health care providers are not recognizing all patients who could benefit from ACE-I. Changes in service providers can result in unintended changes in medication.

ADDENDUM

This study was presented to the Diabetes Program and to the ANMC Pharmacy and Therapeutics Committee. A number of interventions have been implemented as a result:

1. The annual diabetes chart audit will now use the Health Summary including the computerized pharmacy and laboratory records.
2. An electronic diabetic flowsheet has been developed and is printed for the medical provider at every clinic encounter. This flowsheet contains prompts for overdue preventive medical care and labwork.

3. A patient handout has been developed on microalbuminuria that includes the suggestion that appropriate medical interventions be discussed with one's healthcare provider.
4. Continuing medical education programs at ANMC in the care of patients with diabetes will emphasize ACE-I use.

The ANMC Pharmacy Department and the Diabetes Program are currently working on two additional interventions:

1. For those patients with diabetes and hypertension, an automated prompt to "Consider ACE-I" will be inserted in the medication refill procedure.
2. An algorithm is being developed for independent pharmacy practice in initiating ACE-I therapy in patients with diabetes and hypertension or proteinuria.

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COLD STRESS, REVERSE T_3 AND LYMPHOCYTE FUNCTION

Percival D. McCormack, MD, PhD⁽¹⁾

J. Thomas⁽²⁾

M. Malik⁽²⁾

C. M. Staschen⁽²⁾

ABSTRACT

Following a recently reported rise in serum reverse triiodothyronine levels in response to cold exposure, an initial in vitro study has been carried out on human lymphocyte function. The first part of the study demonstrated that the uptake of rT_3 on lymphocyte nuclear receptors increased as the rT_3 concentration was raised above the normal serum level. The binding is competitive with triiodothyronine. The lymphocytes were harvested from venous blood donated by young male U.S. naval personnel.

The second part of the study involved lymphocyte proliferation assays carried out with the addition of increasing amounts of rT_3 . Both non-specific (three different mitogens) and specific (recall antigen) stimuli were used. There was an indication that lymphocyte function is depressed by increasing serum concentration of rT_3 . However, with a small number of test subjects and a resulting low statistical power, it was not possible to establish a statistically significant association. Lymphocytes from umbilical cord blood, which has a very high level of rT_3 compared to that in normal adult sera, were also found to have a much reduced lymphocyte stimulation index. The requirements for a more definitive investigation are outlined.

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INTRODUCTION

Studies of reverse triiodothyronine (rT_3) and T_3 serum levels in Naval personnel during a three-month operational tour in Alaska in 1995 revealed (1) a significant rise in serum rT_3 levels and decrease in serum T_3 levels. The "low T_3 " syndrome has been observed in prior studies (2), and the raised rT_3 levels have been observed in studies involving surgical trauma, hyperthermia, febrile illnesses, burn injuries and nutritional deficits (3-6). It has also been reported to occur upon exposure to high altitude and hypergravity (7,8). This suggests that the rise in serum rT_3 (and reciprocal decrease in T_3) is a general physiological stress response. In most of the stressor situations listed above, the subjects have been in a state of more or less immunosuppression. The question then arises: does rT_3 play an active or passive role in stress-produced immunosuppression? Two recent studies have clearly demonstrated cold-induced immunosuppression. The first (9) involved mice exposed to cold water stress. Various cells in the immune system were studied, with the emphasis being on macrophages. The second involved observations on personnel wintering in Antarctica (10), where decreases in cell-mediated immunological responsiveness were demonstrated.

Another related observation is the very high levels of rT_3 in cord blood (8 to 10 times higher than the normal adult serum values)(11,12). Although still at the experimental stage, cord blood is being used in lieu of bone marrow in the treatment of leukemia (13). The "graft-versus-host" response is apparently considerably reduced. Could this be due, in whole or part, to immune system suppression by the raised rT_3 serum levels?

A mechanism for this effect came with the identification of rT_3 receptors on lymphocytes (14). The presence of high affinity, low capacity binding sites for high affinity, low capacity binding sites for T_3 in

the human lymphocyte had been previously demonstrated (15). The binding capacity and affinity for rT_3 are much lower than those for T_3 .

Under physiological conditions and when in competition with T_3 , it is unlikely that the presence of rT_3 will have any significance. However, under pathological and stress conditions, when the serum level of T_3 decreases and that of rT_3 increases, the binding of rT_3 to the lymphocyte receptors may indeed become significant. An important point to note regarding rT_3 is its relatively short half life in serum – about 8 hours, compared to about 35 hours for T_3 . Triiodothyronine is degraded by the enzyme 5'-deiodinase to 3,3'-diiodothyronine (T_2), for which it is an important precursor (16). The first objective in this study was to determine whether increased uptake of rT_3 occurs on lymphocyte receptors in the presence of increasing rT_3 concentration. If the uptake of rT_3 on lymphocytes was increased, the second objective was to determine whether this results in a significant decrement in lymphocyte function.

MATERIALS AND METHODS

Blood Processing

Heparinized blood was obtained from young, healthy male volunteers (U.S. Naval personnel) and from the cords of newborns on the day of birth by venupuncture. The blood was centrifuged at 400Xg for 10 minutes at room temperature. The plasma fraction was removed and stored at -70°C . The cellular fraction was diluted with equal volume of Hanks balanced salt solution without Ca^{2+} and Mg^{2+} (HBSS) and then layered over a 15 ml Ficoll-Isopaque cushion. The sample was then centrifuged at 400Xg for 30 minutes at $18-20^{\circ}\text{C}$. The lymphocyte interface was aspirated, washed twice in HBSS, and the pellet resuspended in RPMI 1640 media. The cells were counted using a hemocytometer. Coagulated cord blood was centrifuged at 3000 rpm for 10 minutes. The serum was stored at -70°C for later analysis.

Cell Culture

Peripheral Blood Mononuclear Cells (PBMC) or Cord Blood Mononuclear Cells (CBMC) were cultured in RPMI 1640 media (Gibco BRL, Gaithersburg, MD) supplemented with 4mM L-glutamine, 5×10^{-5} M 2-mercaptoethanol, 100 U/ml penicillin, 100 $\mu\text{g}/\text{ml}$ streptomycin, and 10% heat-

inactivated normal human AB^+ serum (ABI, Columbia, MD). For the CBMC experiment, part of the cells were cultured in media supplemented with autologous plasma (10% or 20%). Phytohemagglutinin (PHA), concanavalin (Con A), and pokeweed mitogen (PWM) were purchased from Sigma Bioscience (St. Louis, MO). Tetanus toxoid was obtained from Connaught (Willowdale, Ontario, Canada).

Lymphocyte Receptor rT_3 Uptake

Non-radioactive rT_3 was obtained from Sigma Chemical Company (St. Louis, MO). All other chemicals used were of high grade. $[^{125}\text{I}]\text{T}_3$ was obtained from New England Nuclear Corp.

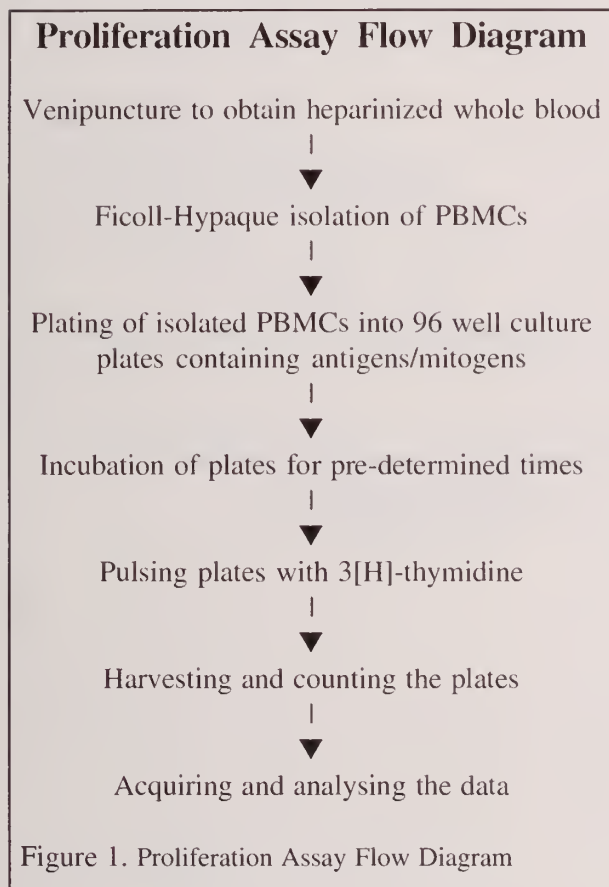
rT_3 assay. Serum rT_3 concentrations from cord and venous blood were determined using a commercial radioimmunoassay kit (Wien Laboratory, New Jersey). The intraassay and interassay coefficients of variation when repeated samples were analysed were 4.7% and 5.9% respectively.

Receptor competition experiment. Lymphocytes (10^6 cells per ml of blood) were incubated at 37°C for 2 hours with 0.5 nM $[^{125}\text{I}]\text{T}_3$ and increasing amounts of unlabeled rT_3 (33%, 100%, 133% and 200%) in serum free media (RPMI 1640). Unlabeled rT_3 was dissolved in .05N NaOH just prior to use. The exact concentration added in each assay was tested by rT_3 RIA. The incubation was carried out in a total volume of 1 ml of protein-free medium. Each assay was run in triplicate. The reaction was terminated by centrifugation at 4°C for 10 minutes. Pellets were then washed twice with 1 ml RPMI 1640 and counted on a gamma counter.

rT_3 Effect on Lymphocyte Function

The lymphocyte proliferation assay is used as an *in vitro* surrogate, similar to the *in vivo* delayed-type hypersensitivity assay, to assess the overall quality and character of the cellular arm of the immune response (17,18). The lymphocyte proliferation assay is used to assess congenital immune deficiencies, transient immune compromised states and recently the progressive immune deficiency of HIV infection. The assay assesses the ability of peripheral mononuclear cells (PBMCs) to proliferate in response to various non-specific (mitogen) and specific (recall antigen) stimuli. The mitogens PHA, PWM, ConA and the recall antigen, tetanus toxoid (TT), were used in these experiments. These stimu-

late a complicated series of events that ultimately lead to cell division. Although cell division may be determined by simple microscope enumeration of cells before and after stimulation, this technique is both labor intensive and prone to error. It has been replaced by the incorporation of [^3H] labeled thymidine into newly synthesized DNA and particle counting. The flow chart in Fig.1 illustrates the steps involved in this assay.



Lymphocyte Proliferation Assay

1×10^5 PBMC from healthy young males were incubated in a 96 well-round-bottom plate (Costar, Cambridge, MA) with $20 \mu\text{g/ml}$ of Con A, $2 \mu\text{g/ml}$ of PHA and $2.5 \mu\text{g/ml}$ of PWM alone and different concentrations of rT_3 (1.26 ng/ml , 0.83 ng/ml , 0.63 ng/ml and 0.21 ng/ml). Note: the normal rT_3 concentration in adult serum is about 0.21 ng/ml . Three concentrations of TT were used (3.25 L.f. , 1.62 L.f. and 0.81 L.f.) alone and in combination with different concentrations of rT_3 as used for the mitogen assay. The assay was performed using replicates of five wells per each mitogen/ rT_3 combination, as well as per each antigen/ rT_3 combination. As a control, six wells of media alone were measured for the

mitogen assays and nine wells of media alone were measured for the antigen assay.

Because of the short half-life of rT_3 in serum (8 hours), in a second set of mitogen experiments rT_3 was added to the culture every 24 hours, until ^3H -labeled thymidine was added. Following three days of incubation with mitogens and seven with TT, the plates were pulsed with $1.67 \mu\text{Ci/well}$ of ^3H -labeled thymidine for 18 hours, harvested (Skatron Instrument, Sterling, VA), and counted in a beta-counter (Betaplate, model 1205; Upsala, Sweden). Data were expressed as a Lymphocyte Stimulation Index ($\text{LSI} = \text{mean specific proliferation} / \text{mean background proliferation}$).

Lymphocyte Proliferation Assay with CBMC

1×10^5 CBMC were resuspended after Ficoll-Isopaque separation in media supplemented with 10% NHS or 10% or 20% autologous plasma. Cells were incubated in a 96 well-round-bottom plate (Costar, Cambridge, MA) with $20 \mu\text{g/ml}$ of Con A, $2 \mu\text{g/ml}$ of PHA, and $2.5 \mu\text{g/ml}$ of PWM. Following 3 days of incubations with mitogens, the plates were pulsed with $1.67 \mu\text{Ci/well}$ of ^3H -labeled thymidine for 18 hours, harvested (Skatron Instrument, Sterling, VA) and counted in a beta-counter (Betaplate, model 1205; Upsala, Sweden).

EXPERIMENTAL RESULTS

Lymphocyte Receptor rT_3 Uptake

The normal concentration of rT_3 in adult human serum is about $.21 \text{ ng/ml}$ (or $.32 \text{ nmol/liter}$). Taking this as a baseline it was decided to increase the concentration by 100%, 300%, 400% and 800%, and to measure the resultant displacement of T_3 from the lymphocyte receptors (and presumably the uptake of rT_3 on these receptors). Five test subjects were used to supply venous blood and the results were "pooled", or averaged, at baseline (normal rT_3 concentration) and at each of the concentrations listed above. A linear regression analysis was performed and the result is shown in Fig.2. The slope is significant at the $p = .05$ level. A decrease in receptor uptake of about 45% is indicated. There was an 800% increase in the serum rT_3 concentration, and the affinity of rT_3 for the lymphocyte receptors is some 18 times less than that of T_3 . This is small but less than the factor of 50 estimated by Lemarchand-Beraud et al (14). Even under extreme cold conditions the increase in uptake of rT_3 by

receptors would be less than 10%. The question then arises as to whether such small changes would result in clinically significant alteration in lymphocyte function. In other stress situations, such as febrile illness, malnutrition and surgical trauma, and in cord blood, the rise in rT_3 is much larger, and significant changes in lymphocyte function would be more likely.

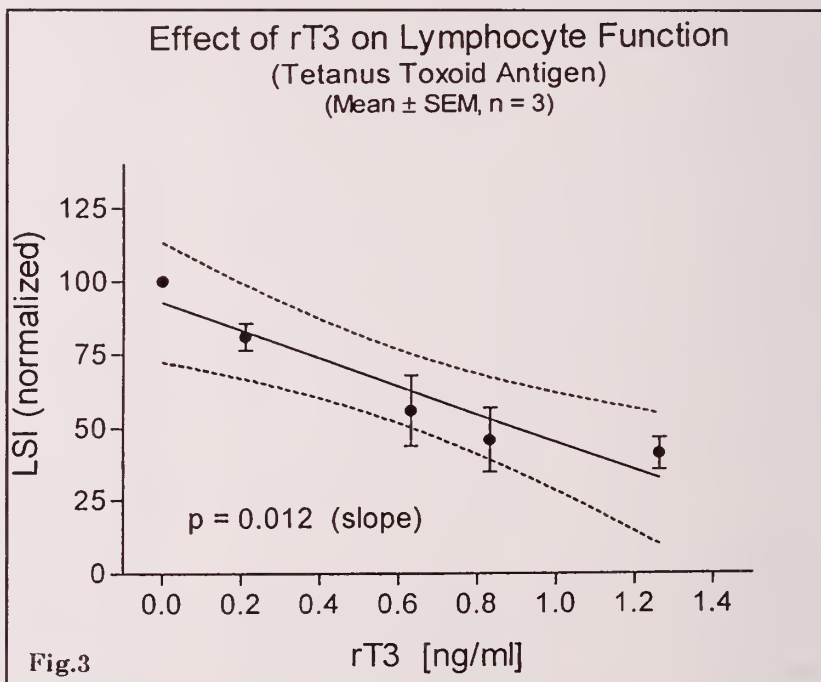
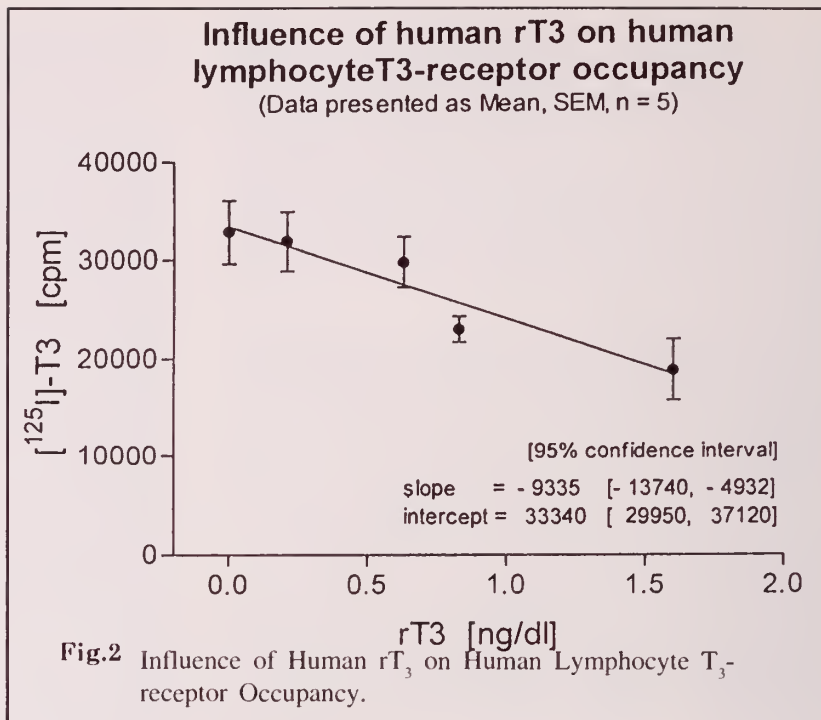
rT_3 Influence on Lymphocyte Function

Tetanus Toxoid Response

A linear regression analysis of the LSI data for three human venous blood samples is shown in Fig.3. Added rT_3 concentrations of 0, 0.21, 0.63, 0.83 and 1.26 ng/ml were used. At each concentration three measurements of LSI were made at three different TT concentrations and the results averaged. The LSI results in Fig.3 are given as percentages, with 100% being assigned to the LSI value at zero added rT_3 (serum samples only). The regression line is significant at the $p = 0.05$ level. A reduction of about 50% in LSI (lymphocyte response to TT) is indicated over the range of concentrations used.

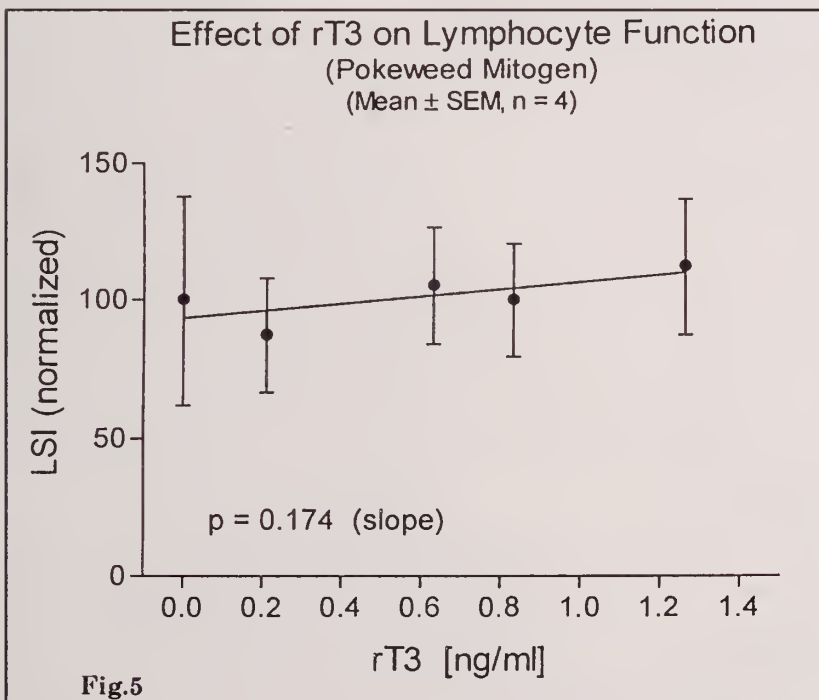
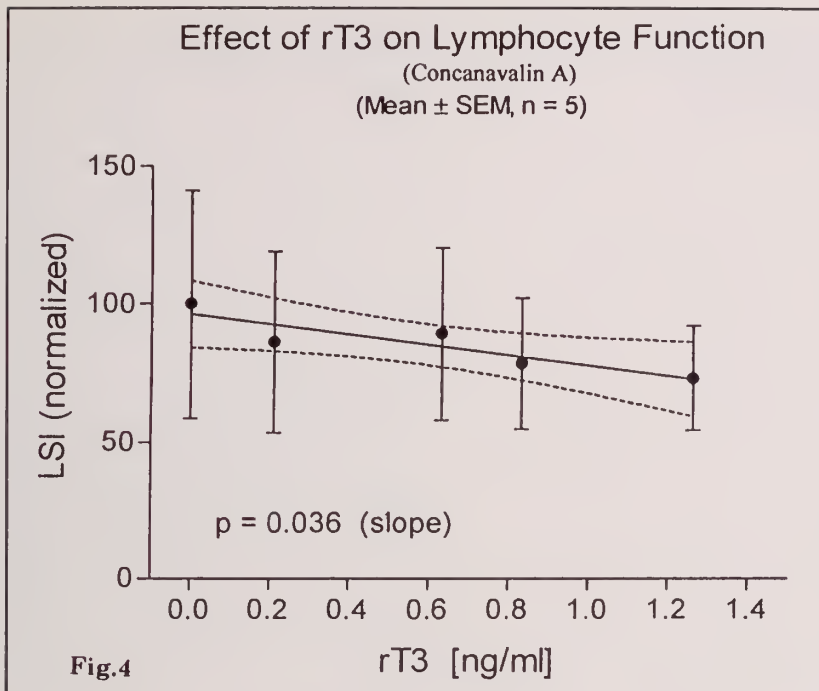
Mitogen Response

As for the TT experiment, the LSI values were computed on the basis of the mean of five samples at each rT_3 level; normalized to the zero added concentration value, and a linear regression analysis carried out. The results for Con A are shown in Fig.4. A much smaller change in lymphocyte response with rT_3 concentration is indicated – a decrease of about 15% in the LSI value. The result is statistically significant. The results for PWM and PHA are shown in Figs.5 and 6, respectively. Again, the variation with rT_3 concentration is small and in neither case reached statistical significance ($p > 0.05$). In the case of PWM, the LSI appeared to increase slightly with rT_3 concentration.



Mitogen Response with Daily Addition of rT_3 during Incubation

The half-life of rT_3 in serum is relatively short (about 8 hours) and has been attributed to the action of the enzyme 5'-deiodinase. Because of the long incubation periods used in the response studies, the possibility of inactivation of the rT_3 was considered to be significant. A series of mitogen response studies was carried out with fresh rT_3 being added



experiment all three mitogens showed a consistent reduction in the LSI associated with the addition of rT₃. The percentage decreases in LSI were about 28% for PHA, about 43% for PWM and about 38% for Con A. With only 5 test subjects the p-values indicate that the observed reductions are not statistically significant at the p=0.05 level.

rT₃ in Human Cord Sera and Lymphocyte Stimulation Index

The normal concentration of rT₃ in adult sera lies in the range 0.07 to 0.29 ng/ml compared with 3.0 to 3.3 ng/ml in cord sera (19). Several studies have demonstrated diminished cytotoxic and proliferative responses of cord blood relative to adult blood (20,21). In assays on 16 young male test subjects, the mean serum concentration was determined to be 0.27 \pm 0.04 ng/ml. Several measurements on cord blood samples produced an average of about 2.15 ng/ml – a factor of about eight times higher.

Lymphocyte stimulation indices for adult blood were taken from the baseline data (zero rT₃ added) given above and averaged. The values were 888, 295 and 716 for PHA, PWM and Con A, respectively. The mean values for four cord blood samples (10% "patient" plasma) were 196 for PHA, 58 for PWM and 105 for Con A. These represent decreases in LSI by factors of 4.5 for PHA, 5.1 for PWM and 6.8 for Con A.

STATISTICAL ANALYSIS

Because of funding limitations, the number of test subjects used in this work was very low (4 to 6) and so the powers of the analyses were very low. Although the subjects were all healthy, young males, there were many other factors not controlled. The thyroid and immune status of each test subject was not assessed. For example, it is known that

daily during the incubation phase. Five healthy young males were used as blood donors in this experiment, and for each mitogen there was one control group (no rT₃ added) and one test group (treated with 1.26 ng/ml of rT₃). Fig.7 shows a graph of actual mean LSI values and standard errors of the mean for the control and test groups. Fig.8 shows a Box Plot of the results based on a paired t-test. In this

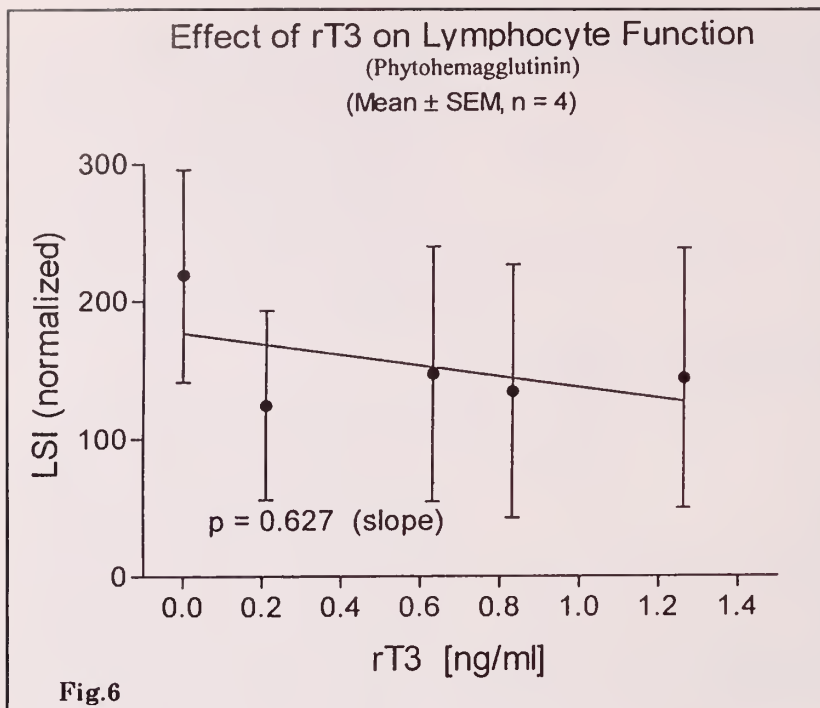


Fig.6

for significance (alpha) was set at 0.05, and the test is one-tailed, which means that only an effect in the expected direction will be interpreted. The computer program Sample Power Version 1.0, SPSS, Inc. was used for each of the mitogen results, to achieve a power of at least 90%, in order to determine the required sample size for the two groups. The results for the three mitogen studies are given in Table I. The smallest effect that would be clinically significant was selected as the criterion. Considerable increases in the numbers of test subjects would be required – 48 for PHA; 36 for PWM and 20 for Con A.

DISCUSSION

It is a striking fact that in many of the situations in which immunosuppression occurs – cold exposure, hyperthermia, surgical trauma, febrile illnesses, spinal cord injuries, cord blood etc. – the serum rT₃ concentration is significantly raised over normal adult values. Observations in this work and others, show that in the presence of raised serum levels, the uptake of rT₃ on lymphocyte receptors increases. The mechanism for affecting lymphocyte function certainly exists. The *in vitro* experiments reported here attempted to demonstrate a *direct* effect of rT₃ concentration on lymphocyte function but failed to do so.

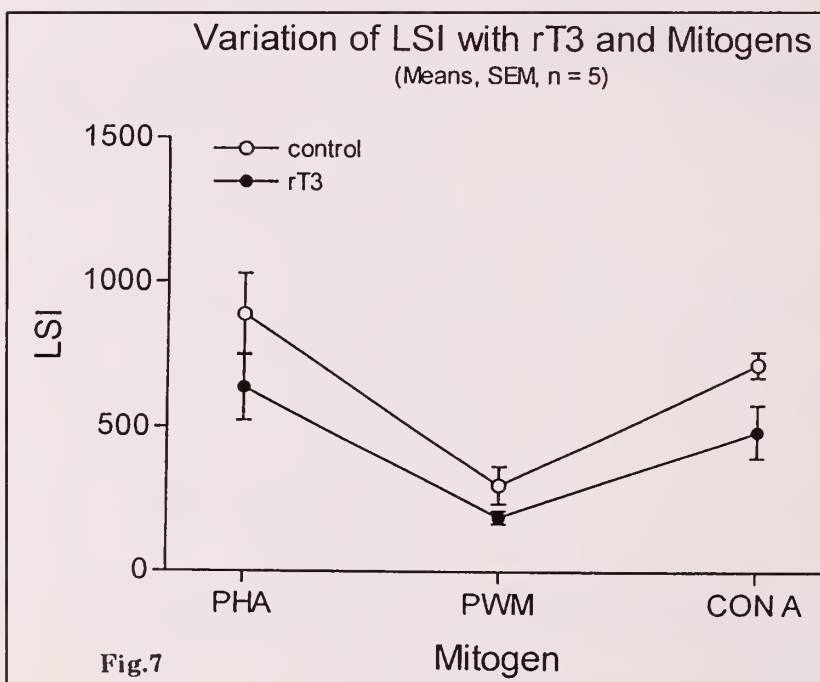
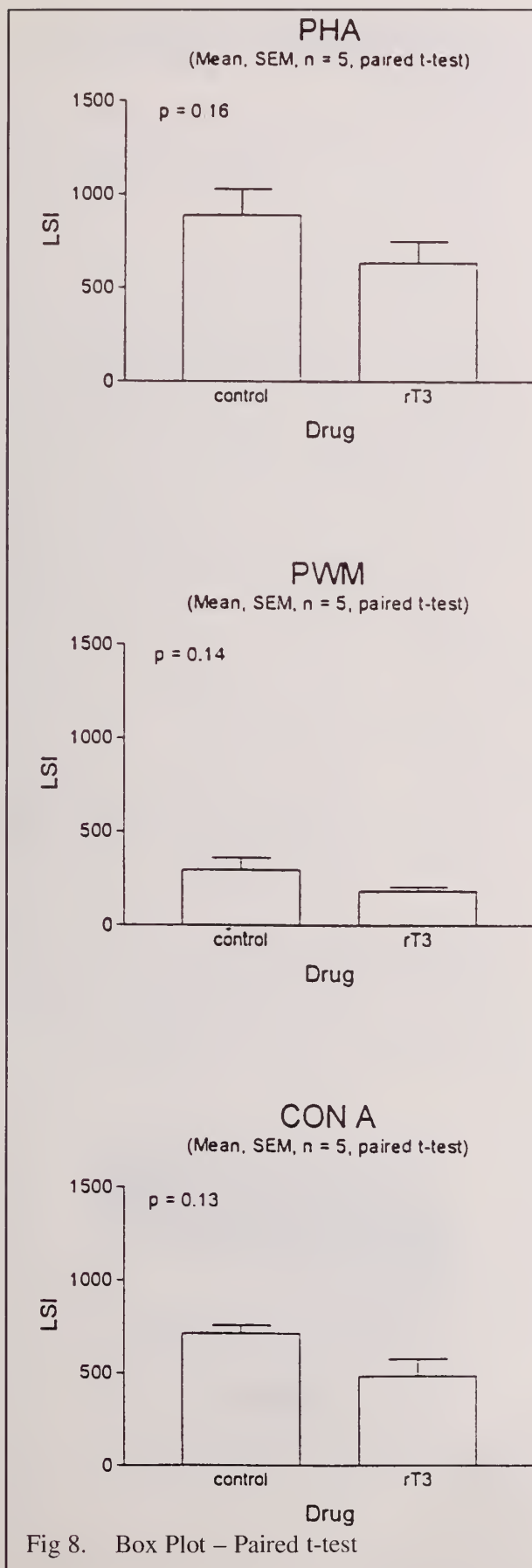


Fig.7

InterLeukin-6 (IL-6) affects thyroid metabolism (22). Moreover, the enzymic breakdown of rT₃ was another uncontrolled variable. With respect to the latter, the experiment described under Mitogen Response With Daily Addition of rT₃ during Incubation was probably the most controlled. There were two populations (with and without added rT₃) and the goal of the study was to test the null hypothesis that the two populations were equal. The criterion

Table I.

Power Study				
(Within-group)				
Con A	10	92.3%	229.6	160.8
PWM	18	91.1%	111.4	109.3
PHA	24	91.0%	251.6	287.4
Mitogen	Sample Size	Power	Mean Difference	S.D.
	(each group)		(in LSI)	



There was, however, a strong consistent indication of a suppression of lymphocyte function in the presence of raised rT_3 when the rT_3 concentration was, to some extent, maintained during the long incubation periods. One further reason for the failure was the small number of test subjects used and the resulting low statistical power. Another improvement required in a follow-up study of this potentially important effect concerns the variability of the rT_3 serum levels in apparently normal young, male adults. The thyroid status of each test subject must be checked prior to inclusion in the study. Also, a cytokine assay, and in particular IL-6 which has a direct affect on thyroid metabolism, is necessary. As a general indicator of stress level, a cortisol assay should be included. Finally, to avoid the degradation of rT_3 by deiodinating enzymes in the serum and on the lymphocytes, the use of the enzyme inhibitor, PTU, would be a more efficient method of minimizing this loss than the replacement technique used here.

Reverse T_3 has long been regarded as physiologically inactive, but the observations in this work suggest a significant role for this hormone in stress response and immunosuppression.

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Research reported here employing human test subjects, has been reviewed and approved by the Naval Medical Research Institute's Committee for the Protection of Human Subjects.

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Medical Translating Grows as U.S. Economy Globalizes

by Gary L. Monroe, MD⁽¹⁾

Languages and people who could speak them have always fascinated me. My career as a physician who travels and sometimes volunteers has caused me to need medical dialogues in foreign languages. Maybe that is why I was asked to write this article.

Many famous Americans have shared my interest in languages. Teddy Roosevelt made it a habit to read in German, French and English each and every day. Seeing actress Elke Sommer on the big screen caused Gerhardt Fuller, one of America's most diligent linguists to master his first Scandinavian language. JFK made history with his speech to cold war West Berlin. Although he committed a blooper with his "Ich bin ein Berliner," the Germans loved him and his attempt to speak their language. More recently Secretary of State Madeleine Albright thrilled the French by addressing them in their own tongue.

I have worked over fifteen years translating medical Spanish. Recently, after three years of study of the Russian language, I find myself now beginning to translate some medical Russian. Having also worked in Africa as a volunteer and having visited hospitals in Guatemala, Mexico, New Zealand, Austria and Russia, I find myself increasingly caught up in translating. Five years ago I published a book and cassette tapes, "Medical Spanish for Every Situation." I am now working on producing that same work in Russian. The need for educating and maintaining medical translators has become a hobby.

Generally speaking, foreign language education in the United States of America has been relatively weak in the past, but is now on the upswing as the U.S. and other economies realize a need for globalization. Traditional U.S. foreign language education included 2-4 years of high school and or college study. Courses had a heavy emphasis on reading and

grammar but were always weak for lack of practice and practical applications. In my school days, you were given a phonograph record with recorded dialogues and sentenced to one hour of solitude in the language lab. The weaknesses of these courses were forgivable since a practical situation would ideally be to sit with a native speaker and practice dialogues in a variety of situations. This huge gap between book and grammar sessions and the lack of practical exercises has hampered all U.S. students. In fact I

polled friends who had studied foreign languages concerning their fluency in their chosen foreign language. None of these language aficionados was fluent or considered themselves capable speakers of their chosen foreign language unless they had actually lived overseas in the country for 6 months to a year!

Compare American linguists with students of the European systems and the results are striking. Even the maids who change linens in the hotel rooms in Germany speak reasonably good English. However European methods of study differ as well.

According to Bettina Sayyar, a German born registered nurse who now works evenings in Providence Hospital here in Anchorage, foreign language begins for all German students in the fourth grade of school. This study is continued until the completion of middle school for students who subsequently enter carpentry and plumbing and other technical fields. The study continues for another 3 years for students who plan to enter college. As you can see, trade school education in Germany includes 6-7 years of a second language, usually English. This compare to 2-4 years of study for American graduates, even those who finish with a language major. Most Germans study a third language as well, beginning at the seventh grade of school.

Bettina also comments that Americans have less basic knowledge of grammar compared to European

... foreign language education in the United States is on the upswing as economies realize a need for globalization.

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counterparts. For instance American students have less ability to, for instance, define a predicate nominative or indicate the dative case. Other examples would be recognizing the instrumental case as frequently used in Russian, but which is also used in English.

Bettina reminds us that German schools require all students to study a foreign language for six to seven years. These are required courses for all students.

There exist some strong obvious reasons for the differences in foreign language studies in the U.S. verses European and other systems. Germans would need to speak Spanish, French, Italian and English to participate in marketing of products on a scale similar to Americans who can easily reach 250,000,000 potential U.S. buyers with a single language. This has been a huge advantage to American businesses in a relatively regionalized market. A single language now becomes a disadvantage as globalization of goods and services occurs.

Just as remarkably, a trip through Europe the distance one covers from New York to Los Angeles would require 4-6 languages to perform such activities as filling the gas tank, buying a hamburger or renting a motel room.

After having discussed some of the differences between educational systems for foreign languages and the reasons for them, let's now look at special aspects of medical translators.

Research of public records in the Loussac Library in Anchorage in 1996 revealed that non-English speaking Hispanics represent 6% of the Alaskan population. This would be close to 30,000 Hispanics in Alaska. The second largest group of foreign language speakers were listed as Korean. Other Asians including Filipinos and others followed these groups. A 1996 business plan study estimated approximately two thousand Russian speakers in Alaska. I would bet this number has risen significantly since then.

As you can see there is a moderate, but growing number of foreign language speakers in Alaska. The need for medical translators is growing as well. Sveta Potton, a professional foreign language translator in Anchorage estimates that she has about 50 patient encounters for translations per year. Karina De Lon, a Providence Hospital based surgery technician who speaks Russian only translates about twice per year. There is also some need for medical translation in medical offices around the state. Some need for medical translation comes about as chari-

ties and churches in Alaska evaluate prospective charity cases in Russia, Mexico, Korea and other countries to receive the benefits of their mission projects. As in other states, like Texas, the legal requirement to obtain informed consent will eventually require more medical translating services.

A number of unusual situations arise within the medical translators themselves. For instance some translators are children of illiterate immigrant parents who nonetheless speak their languages with fluency. These translators learn their foreign languages from parents who seldom read. Additionally this group may have no medical training at all. This leads to the use of non-specific, general expressions and terminology. Although the quality of these translations is technically poor, their fluency in the spoken tongue provides a great deal of help in translating and ministering to patients. A great deal depends upon the individual translator.

Some medical translators, such as American citizens who received their medical training overseas and return to practice here in the U.S. have excellent medical language skills.

A number of medical translators who entered the U.S. as foreign immigrants were also trained in a medical field overseas. Many of these translators never practice their medical profession here in the U.S. They have excellent foreign medical language skills, but may lack necessary American medical terms.

Another unusual situation arises when the medical translator speaks Spanish, for example, but uses a different dialect than other Spanish speakers. In the case of Castillian Spanish speakers vs. Tex-Mex Spanish speakers we see that one calls a surgical procedure a *dilatacion y curetage* and the other calls the procedure the act of *hacer una raspa*. This procedure with two names is of course a dilatation and curettage in English. Asking a Castillian speaker if she would consent to having an *hacer una raspa* may be the same as asking her if she would like a sno-cone. This small idiomatic difference can signal a big change in meaning!

Methods for acquiring medical translating skills are many and include participation in formal and informal language courses, making trips overseas to strengthen language skills, volunteering in mission as well as community based efforts with foreign speakers, and even travel overseas for immersion courses. Additionally making friends with foreign speakers is helpful. I've even heard that the U.S. military teaches their language specialists to date and live with foreign language speakers.

With time I have picked up a few tricks and pointers that have helped me to translate and which I believe may help others trying to train as medical translators or to maintain their skill levels.

One very helpful technique is to prepare a list of questions and phrases for each medical situation that you commonly face. Ask your foreign friends to help you translate them into their language. Prepare your list with the English and other language side by side on your sheet of paper. You can be a very helpful translator by asking questions that can easily be answered with a yes or no. This technique can be greatly expanded upon by your preparation of an extensive group of phrases and questions for just about every imaginable situation. These would include questions from everything needed in a complete medical history and physical exam to such urgent situations as dealing with the patient with chest pain. Also this special project should include phrases to help in special situations, such as what to tell a patient while you are starting an IV infusion or administering an enema.

The task described above can be greatly simplified by using an existing book of medical Spanish phrases and adding to it your special phrases and questions by writing them in on the margins of the pages in the appropriate areas.

Once a nurse saw me translating and was very impressed with my translation until she saw that I was using a list of prepared notes. I was surprised at her disappointment. I consider the use of custom notes as being the mark of a professional.

A few years ago a newspaper ad in Houston, Texas for a nursing position said "Spanish Helpful." Not long ago, I saw an ad in that same paper. It said, "Spanish Required." One forecaster said that the United States will be 25% Hispanic by the year 2010. There is every reason to believe other foreign languages will increase in usage here as well. Most foreigners or their children will learn English. Some groups may not. The future is unfolding.

There are various reasons why some people will be interested in medical translating. Some will be interested in the satisfaction of communicating with others in another language. Some will use language to satisfy religious beliefs about helping others. Some people simply want to receive a bigger paycheck or are looking for greater opportunities. One thing is certain. The twenty-first century will be a multilingual and multinational one. Medical translating is set for growth.

Letter to the Editor . . .

Dear Editor,

I read with significant interest, Dr. Ken Zafren's account of the Ptarmigan Peak Rescue on June 29, 1997, (*Alaska Medicine*, Volume 40, Number 2, April/May/June 1998). Of particular note to me was the part where he stated "Jennifer Nelson...was very concerned about triage, also. She said that had she realized I was there, she wouldn't have been so assertive about putting her paramedics in the field immediately." First of all, I never recall saying that. As with the majority of the members of the Anchorage Fire Department, the paramedics under my charge that evening were very competent in the skill of rapid triage, assessment, and treatment of patients in a multiple casualty incident. Since I am not familiar with the level of training received in this area by other rescue personnel, including Dr. Zafren, it would have been a serious mistake to delay sending paramedics to the location just because a doctor was present. Granted, physicians have a significantly greater medical background than paramedics and other medical technicians, it does not make them experts in all aspects of the field. I know what level of training the AFD paramedics have in rapid patient assessment, triage, and treatment in difficult situations. I do not know what level of education and practice Dr. Zafren has in that field. I knew that my personnel were more than capable of handling the situation in the most efficient and medically appropriate manner available. After reviewing the incident in detail with the AFD paramedics on the scene, and later with the PJs, and some of the Alaska Mountain Rescue techs, I discovered that the AFD medics had performed all of the triage operations and stabilized all of the patients with the invaluable assistance of the PJs and the AMRG techs. Dr. Zafren's concern about the abilities of one rescuer handling multiple patients appears to be a moot point, as there were at least twelve rescuers at the site of the accident. This being the case, if presented with a similar circumstance in the future, I will again demonstrate the same level of assertiveness to make sure that qualified personnel are dispatched to the scene.

As an aside note, judging from all of the photographs that Dr. Zafren took of the AFD paramedics assessing and treating the patients, I know I made the

(continued to page 71)



MARTHA GRAY KOWALSKI, MD

1916 – 1998

Martha Gray Wilson Kowalski, MD, died Sunday June 28, 1998, in Fairbanks, Alaska.

Martha was born in Gastonia, North Carolina, and graduated from Florida State College for Women and the University of Michigan Medical School. In Ann Arbor she met Henry John Kowalski, also a medical student. The couple graduated in 1944 and interned in Boston, Massachusetts. A general practitioner, Martha had a special interest in obstetrics and dermatology, and a special concern for adolescents and the aged. She was a member of the Bush Medicine and Public Health Committee of the Alaska State Medical Association.

Martha was widowed in 1955 and practiced at Group Health Cooperative in Seattle until 1966, when she relocated to Fairbanks, Alaska. For some years she was the only woman doctor in the Interior.

Martha practiced at the Tanana Valley Clinic until her retirement in 1981. She loved Alaska and the challenge of unique, circumpolar health problems.

In 1982, Martha joined the Peace Corps, and for the next four years made her home in Nakuru, Kenya, where she taught anatomy and immunology to rural health care practitioners.

Martha loved the wilderness, art, music, and photography. With her family she hiked and canoed hundreds of miles in Washington and Alaska. On her retirement she was elected to honorary lifetime membership in the Alaska State Medical Association.

Martha leaves her five children, their spouses, and ten grandchildren.

From Out of the Past — Thirty Years Ago. . .

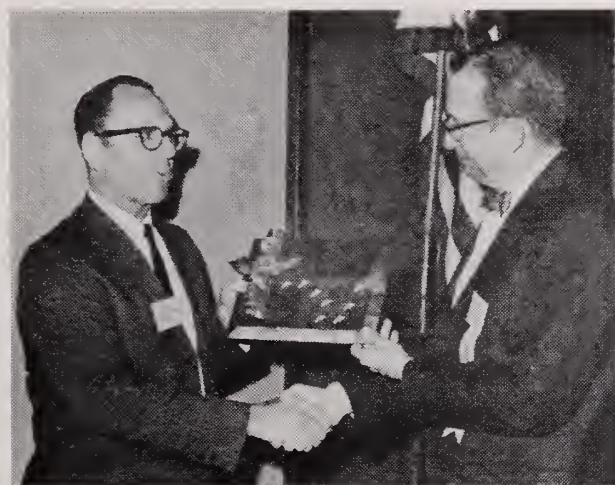
Gloria K. Park, MD

ALASKA STATE MEDICAL ASSOCIATION TWENTY-THIRD ANNUAL MEETING [1968]

Three hundred and seventy-four physicians, exhibitors, and paramedical persons attended the Twenty-Third Annual Convention of the Alaska State Medical Association June 7-10, 1968.

During the annual banquet Friday, June 9th, the physician of the year, community service, and other awards were presented. The physicians of Bassett Army Hospital in Fairbanks were honored as the physicians of the year. The inscription on the plaque presented Lt. Col. Philip W. Hardie, Commander, Bassett Army Hospital, read as follows:

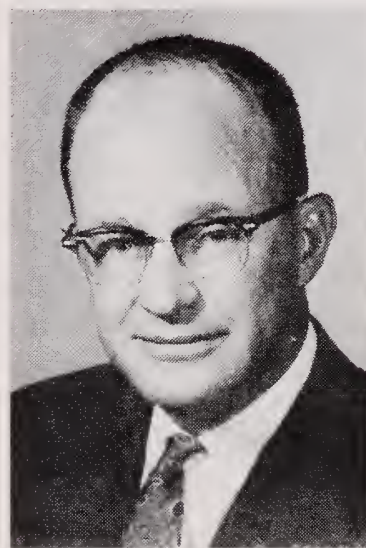
"Rising like a phoenix from its own waters of destruction Bassett Army Hospital, while bandaging its own wounds, turned to mend the wounds of Fairbanks; a legacy to mankind fulfilled; a mandate for others to follow"



LTC Philip W. Hardie, Jr., commander, Bassett Army Hospital and Robert B. Wilkins, M.D., president, Alaska State Medical Association. Photo by Betzi Woodman, Anchorage.

James A. Lundquist, M.D., the new President of the Alaska State Medical Association, presented Robert B. Wilkins, M.D., Past-President of ASMA, a plaque of appreciation for his many years of service to Alaska's medical organizations.

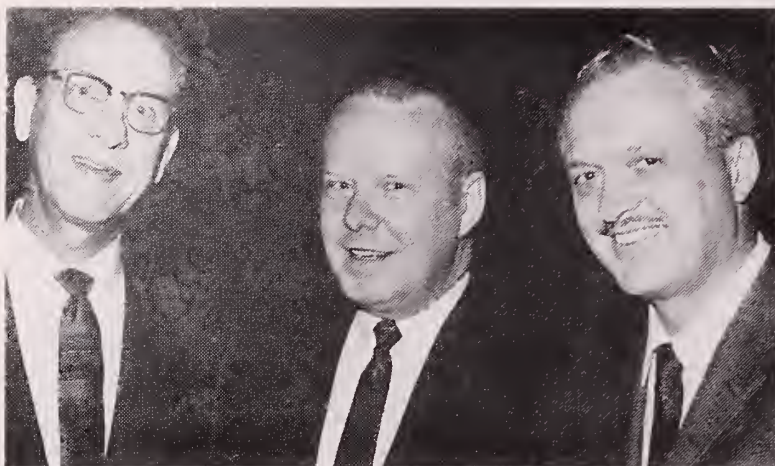
Milo Fritz, M.D. of Anchorage received the A.H. Robins 1968 Community Service Award for his years of service to many small and large communities throughout Alaska.



Milo H. Fritz, M.D.

The Editorial Board of ALASKA MEDICINE presented Arndt von Hippel, M.D., the editor-in-chief, a plaque commending him for his time and effort in making ALASKA MEDICINE a widely read and widely admired medical journal.

1968 CONVENTION PICTORIAL



Donald K. Freedman, Director
Alaska State Department of Health
and Welfare, Public Health Division

James A. Lundquist, M.D.
President, Alaska State Medical Assoc.
Robert L. Smith, M.D.
Assistant Surgeon General



Robert B. Wilkins, M.D.
Past President, ASMA



Arndt von Hippel, M.D.
Chairman, Convention
Program Chairman

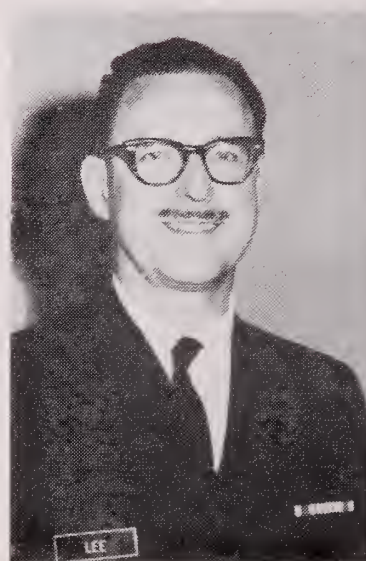
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Committee and Resolution
Committee



Paul Issak, M.D.
Pres.-Elect, ASMA

James A. Lundquist, M.D.
President, ASMA

Dr. John F. Lee, newly
appointed by U. S. Public
Health Service as Director
for Alaska Native Health
Area.



[First paragraph of]

**ADDRESS DELIVERED BY SENATOR
ERNEST GRUENING
TO THE ALASKA STATE MEDICAL
ASSOCIATION**

JUNE 5, 1968

Dr. Wilkins, Dr. Tower, and Members of the
Alaska Medical Society:

It gives me a peculiarly nostalgic and pleasant feeling to be addressing, I think for the first time since I graduated from Medical School, a group of members of my former profession. I went to say that those four years in Harvard Medical School were certainly not wasted years. Although I decided then to leave the care of the human body for attention to the ills of the body politic, and although I did not know what was going to happen at the time, I have never regretted the wonderful education I got then, and I have appreciated its usefulness in subsequent years of my government service.

[First paragraph of paper on]

**COMPREHENSIVE HEALTH PLANNING
FOR ALASKA
ITS MEANING AT STATE AND LOCAL
LEVELS**

[June 7, 1968]

By Donald L. Freedman, M.D.

*Director, Division of Public Health,
Alaska Department of Health and Welfare*

I believe Comprehensive Health Planning will become a great thing for Alaska - given time! In substantiation of this belief, my talk will cover 3 topics related to CHP:

- I. Its significance to Alaska
- II. Its dynamic nature
- III. The role of physicians

The term "health" in this context will be used in its broadest sense. It includes all health services provided by professionals and by paramedical personnel; services of public as well as private institutions; preventive, diagnostic, curative, social and rehabilitative services; and such health-connected factors as education, transportation, safety, sanitation, purity of water and air, and industrial health.

[First paragraph of]

BATTERED CHILD SYNDROME [1968]

By George Brenneman, M.D.

*Alaska Native Medical Center,
U.S. Public Health Service, Anchorage*

This paper presents a general review of the problem of battered children. Many articles cited in the bibliography examine aspects of the problem in much greater detail. The purpose of this paper will be served if the medical profession in Alaska is made more aware of the Battered Child Syndrome and of its role in the management of the problem.

[Three paragraphs of]

**COLD INJURY: REPORT OF AN
UNUSUAL CASE**

By James A. Wilson, M.D.
and Arthur N. Wilson, Jr., M.D.

The purpose of this paper is to relate our combined experiences with a rather unusual case of cold injury involving prolonged cold exposure treated with several modalities including a portable hyperbaric oxygen tank.

On February 17, 1965 after it had snowed over 12 feet in three days in the mountains of Southeastern Alaska and Western British Columbia, an avalanche occurred partially inundating the Granduc Mining Camp in Northeastern British Columbia. Because of the inclement weather, evacuation to any nearby Canadian facility was impossible, and a medical team and rescue force were dispatched from Ketchikan, Alaska, to supervise early treatment and evacuation of most of the miners.

Approximately 79 hours after the avalanche occurred, a husky, young carpenter was uncovered deep in the snow. His discovery was inadvertent as a bulldozer was being used to clear snow away from the helicopter pad and fortuitously the blade lifted off snow and exposed the patient. The patient was found to have been pinned horizontally on his right side in a building as it was crushed by the snow. He had lain with his right arm extended over his head, otherwise pinned on his side and able to move only his feet in his boots, and his left arm, below the elbow. He was without gloves but had on heavy wool clothes and a stocking cap. Initially, he was knocked unconscious but later regained consciousness and lapsed in and out in a phasic fashion, occasionally eating snow and thinking that he heard the voices of his fellow workers. Rather miraculously, he was the thirteenth found of some 27

people buried and the only one who survived the entombment who was buried more than two hours.

It was our good fortune and the salvation of the patient that at this time we received the assistance of Dr. William Mills, orthopedic surgeon and Arctic cold weather injury expert, from Anchorage, Alaska. He had just returned from Operation Polar Strike and brought with him Capt. William Sugden and their specialized knowledge and equipment for managing cold exposure problems. Of particular help was a pH meter which showed some very striking facets of our patient's electrolyte problem. Their help was generously given, and there is no doubt that it saved the patient's life and contributed greatly to his rehabilitation by limiting the extent of his injuries.

[Three paragraphs taken from]

**SALMONELLA ANATUM:
REPORT OF AN ALASKAN OUTBREAK**
*From the Northern Regional Laboratory, Alaska
Department of Health and Welfare, Fairbanks*

Clifford E. Butler
*Captain, USAF, BSC, Arctic
Aeromedical Laboratory,
APO Seattle 98731
(Fort Wainwright, Alaska)*
Wayne L. Miller
*Bacteriologist, Northern
Regional Laboratory,
Alaska Department of Health
and Welfare, Fairbanks*

Charles T. Marrow, M.D.
*Fairbanks Medical and
Surgical Clinic,
520 Fourth Avenue,
Fairbanks*
Raymond D. Evans, M.D.
*Fairbanks Medical and
Surgical Clinic,
520 Fourth Avenue,
Fairbanks*

Each year, in Central Alaska, the incidence of gastroenteritis increases with the arrival of warm weather, reaches a peak immediately prior to the arrival of cold weather and then falls to a low level during the winter. The disease symptoms may include nausea, vomiting, abdominal discomfort, diarrhea and headache. Fever is absent in most cases. The infection is usually irritating rather than debilitating and normally persists for 24 to 72 hours. In the majority of the patients, a causative agent is not found and in such cases, the disease is assumed to be viral in nature. It is also known, however, that Salmonella and Shigella infections are more prevalent during these periods.

During the epidemic in the autumn of 1964, in one 24 hour period 35 students at the University of Alaska reported to the Health Center complaining of gastroenteritis. Although symptoms were mild in most of the students, four were acutely ill with temperatures ranging from 103° to 104.6°F. All four

were hospitalized.

Three hundred individuals were cultured during the outbreak of gastroenteritis. This group included approximately 215 students, all of whom experienced symptoms to a greater or lesser degree, 84 part-time or full-time food-handlers who were asymptomatic, and one part-time food-handler, a student, who developed minor clinical manifestations.

Salmonella anatum was isolated from 43 members of the group. The 43 patients included 35 students, four full-time food-handlers, and four part-time food-handlers, all of whom were students.

[First three paragraphs of]

POLLUTION

[Anchorage - 1968]

by Clifford P. Judkins, R.S.
*Environmental Health Director,
GAAB Health Department*

During the past 100 years, pollution has spread from the sluggish Mississippi to the mighty Yukon, from Lake Erie to Campbell Lake, and from the air of New York and Los Angeles to Fairbanks and Anchorage; and it continues to spread and threaten our actual existence on this planet. This article will confine itself to water pollution problems within the Greater Anchorage Area Borough.

Human sewage waste disposal practices within the Borough include the use of privies, chemical toilets, cesspools, septic tanks, holding tanks, collector lines, raw sewage outfalls, one aerated lagoon and one small treatment plant. The treatment plant serves one trailer court and is owned and operated by a private firm. The aerated lagoon serves one subdivision and is also owned and operated by a private firm. Together these two treatment facilities serve less than 400 dwelling units. Excluding the 400 homes served by the two treatment facilities, all of the sewage produced within the Greater Anchorage Area Borough (some 14 million gallons per day) is either discharged into the ground or into Cook Inlet. Fort Richardson, Elmendorf Air Force Base, the City of Anchorage, the Greater Anchorage Area Borough, the State of Alaska, and Central Alaska Utilities (the local private utility) all use salt water outfalls to discharge untreated human wastes into Cook Inlet.

Approximately 7 million gallons of raw sewage is discharged into the Inlet every day. While the practice of collecting the sewage through collector systems and dumping it into the Inlet removes the sewage from people's backyards and prevents water

supply, stream and lake contamination, the hazard is just transferred from one location to another. The location of existing outfalls are such that the sewage is quite often swept back to the beach by tides and currents. Recognizable human fecal matter can be found on the beaches from the Port of Anchorage to Earthquake Park on almost any occasion.



Russell C. Smith, M.D.
1903 - 1968

Russell C. Smith, M.D. of Petersburg, Alaska died unexpectedly this August in Seattle of a cardiovascular ailment following abdominal surgery at the Virginia Mason Clinic. At the time of his death, Dr. Smith was taking his first vacation since arriving in Petersburg in 1951.

Dr. Smith received his Medical degree from the University of Wisconsin Medical School in Madison in 1929. He interned at Iowa State University and entered graduate training at Barnes Hospital, Washington University, St. Louis, Missouri.

The passing of Dr. Russell C. Smith leaves a void in the hearts of Petersburg residents who for the past 17 years have learned to love and honor "their" Doctor. They knew him to be a most human and understanding man whose every waking moment was consumed with his work. Long hours were the rule and not the exception for Dr. Smith. He was the confidant and "father confessor" of all who knew him. An Episcopalian, a Mason, and a Shriner, Dr. Smith had a wide circle of memberships and interests, from sponsoring a bowling team to memberships in Medical groups. He was a trustee of the Virginia Mason Research Center, a member of the Industrial Medical Association, an Officer of the Alaska Health Association, and a member of the Alaska State

Medical Association.

Dr. Smith anonymously sponsored a \$200.00 scholarship each year for a graduating High School Senior who was selected by school officials.

There are many stories of Dr. Smith's generosity and thoughtfulness. The community of Petersburg is saddened by the loss of a great humanitarian.

✦ ✦ ✦ ✦ ✦

(continued from page 65 - Letter to the Editor)

correct decision. This was an extremely challenging rescue. My hat goes off to all of those who responded, from the professionals trained in these types of incidents, to those who had no medical background and just happened to be in the area enjoying a sunny Alaska day. Everyone performed in an exceptional manner, and without the help of all those involved, an already difficult tragedy could have become much worse. As with Dr. Zafren, my heart goes out to the families of Steven Brown and Mary Ellen Fogarty.

Jennifer Nelson
Firefighter/Paramedic
(Acting Paramedic Supervisor)
Anchorage Fire Department

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Antithrombotic Therapy for Stroke Prevention among Medicare Beneficiaries Hospitalized in Alaska with Atrial Fibrillation *by Mary Ellen Gordian, MD*



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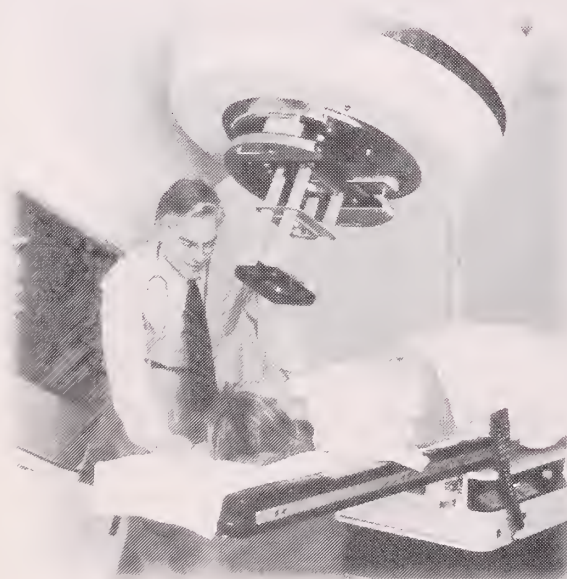
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About the cover: Moose in the Snow.
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Regional Health Assessment relating to mercury content of fish caught in the Yukon-Kuskokwim Delta rivers system

Lawrence K. Duffy⁽¹⁾

Tauni Rodgers⁽²⁾

Molly Patton⁽²⁾

ABSTRACT

Seven species of fish were surveyed for muscle tissue mercury content across a broad area of western Alaska. Total mercury levels were determined by cold vapor atomic fluorescence spectroscopy in 66 fish sampled during 1997. Methylmercury in sampled fish amounted to 97 to 100% of total mercury values. Using mercury consumption risk levels derived from U.S. Environmental Protection Agency hazard assessment models, mean total mercury was determined to be above the human critical value of 0.2 g/g (ppm) in 29% of the fish species, and 62% of the fish species contained mercury exceeding the wildlife critical value for piscivorous mammals. Overall, 24% of the fish exceed the critical value for human consumption and 58% the wildlife critical value. Similarly 31% of sites sampled exceeded the human consumption critical value. Based on the mean of all fish sampled and a small number of river otters, a biomagnification factor of 12 was calculated for the Yukon-Kuskokwim Delta Region of Alaska.

INTRODUCTION

Total mercury concentrations (Hg) in fish tissues are of special concern because of the potential of MeHg to biomagnify through the food chain in aquatic ecosystems. Mercury, as methylmercury (MeHg) in fish, represents a potential risk to wildlife consumers such as piscivorous birds (e.g. eagles and loons) and mammals (e.g. mink and river otters) and possibly to the fish themselves. In Alaska, studies have found Hg in common loons blood and feathers (1). The levels reported may exceed those associated with reduced reproduction in eagles (2). Within the human population, cognitive defects in children with low level prenatal exposure to methylmercury has been reported (3). Sports fisherman and subsistence users, as well as their children, now run the risk of neurotoxic effects. Because of the human health effects and ecological implications, a board sampling survey of fish muscle was begun in 1997 in Alaska. In this report, we compare our initial results with suggested critical values (4).

MATERIALS AND METHODS

A combined total of 66 fish were sampled for mercury. The collection sites were distributed throughout the Yukon-Kuskokwim Delta region as chosen by subsistence users. Fish were collected by multiple collection methods. At the laboratory in Bethel, Alaska, fish were stored at -20 °C until dissected and sent to Frontier Geosciences (Seattle, WA) for analysis. Hg was analyzed by cold vapor atomic fluorescence spectrophotometry (CVA-F) after samples were digested with acid (5).

Regional assessment was conducted by comparing the means of individual species or river location sites with critical values. Critical values used in the analyses were those reported by Yearley et al. (4).

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We also used a recent review of mercury risk assessment (6) to obtain FDA standards. Elemental Hg concentrations were used for MeHg (the more neurotoxic form) because it has been shown that 95 to 100% of the Hg in fish tissue was in the form of MeHg (7). A small subset of our samples were also analyzed for MeHg and the mean for the MeHg species was 96% of the total Hg with a range of 76 to 100% of the total Hg in the MeHg form. When the method of Bloom (7) is used, the upper range increases to 112% and the mean MeHg is 101%.

RESULTS

The mean MeHg levels in fish from the Yukon-Kuskokwim Delta region of Alaska was 0.226 g/g. These fish had overall mean lengths of

17.6 inches. There was a general trend that the larger the fish within a species group, the higher the MeHg content. Table 1 and 2 list the means and standard deviations of the measured MeHg levels for both the individual species and the individual sampling sites with combined species. Sixteen fish (24%) in the Yukon-Kuskokwim Delta sample exceeded 0.2 g/g critical value for MeHg and 38 (58%) of the fish had levels higher than the 0.1 g/g critical value. The 0.1 g/g is the lowest legal limit in the world with 1 out of 26 countries surveyed using this value. The most common worldwide legal limit is 0.5 g/g. Only 9% of the fish exceeded this legal limit.

Using these critical values, percentages of individual species and individual sites showed widespread occurrence of MeHg and that the distribution was not confined to one subregion (Table 3). 85% of

Table 1. Mean Mercury Levels in Y-K Delta Fish Species

Species	Hg mean (mg/g)	SD	n	Human CV (.2 mg/g)	Animal CV (.1 mg/g)	Sensitive CV (.05 mg/g)
Dolly Varden	.017	.022	15	-	-	-
Grayling	.144	.053	12	-	+	+
Burbot	.100	.048	5	-	+	+
Pike	.718	.578	13	+	+	+
Sheefish	.226	.151	5	+	+	+
Suckerfish	.087	.042	3	-	-	+
Whitefish	.132	.084	13	-	+	+

Table 2. Mean Mercury Levels in Y-K Delta Fishing Sites

Site	Hg mean (mg/g)	SD	n	Human CV (.2 mg/g)	Animal CV (.1 mg/g)	Sensitive CV (.05 mg/g)
Andrefski R.	1.068	.803	3	+	+	+
Bethel	.089	.021	4	-	+	+
Emmonak	.155	.181	7	-	+	+
George R.	.270	.397	9	+	+	+
Goodnews R.	.107	---	1	-	+	+
Gweek	.178	---	1	-	+	+
Johston R.	.140	.047	4	-	+	+
Kanektok R.	.064	.081	17	-	-	+
Kogrukluk R.	.096	.045	5	-	-	+
Kuskokug	.206	---	1	+	+	+
Kwethluk	.159	.089	5	-	+	+
Piomute	.813	.451	5	+	+	+
Tuluksak R.	.101	.039	4	-	+	+

Table 3. Percentage of Category Above Critical Value

Category	Legal Value (.5 g/g)	Human Critical Value (.2 g/g)	Animal Critical Value (.1 g/g)
Species	14.3%	28.6%	62.5%
Sites	15.3%	31%	85%
Individuals	9%	24%	58%

the sites exceeded the 0.1 g/g critical value and 100% were above the critical value for sensitive populations with heavy consumption (0.05 g/g). For individual species 62% exceeded the animal CV (health risk for wildlife).

Biomagnification is a process where there is an increase in concentration from one trophic level to another due to the accumulation of contaminants in food (9). If the MeHg concentration of a predator, e.g. river otters is known, then a biomagnification factor for river otters in the Yukon-Kuskokwim Delta region can be calculated from the mean MeHg levels in the fish. This factor was 12 for Yukon-Kuskokwim Delta. This factor is about one third of the biomagnification factor observed in Prince William Sound.

DISCUSSION

Monitoring studies in the lower 48 states have found fish tissue MeHg to be widespread at levels similar to these Yukon-Kuskokwim regional levels (4). Over 50% of fish consumption advisories in the United States are for Hg (8). Similar to data reported in Maine's REMAP study where Hg was detected in 99% of the samples, we detected Hg in 100% of our samples (4). However, in comparing MeHg results of various studies, it is important to note fish sizes. Since our mean length was 17.6 inches, we may be dealing with a sample of larger fish. For example, Bloom's (7) reported range for pike was similar to this study but our mean was higher.

Average total Hg concentration in bass, crappie, dolphin, halibut, mackerel, pike, snapper and tuna range from 0.2 to 0.3 g/g (6). Our mean of 0.23 ppm would provide close to EPA reference dose (RFD) if an average woman consumed about 5 ounces of fish per week. Egeland and Middaugh (6), however, caution about the simple application of the EPA's RFD. They point out the benefits from protein and omega-3 polyunsaturated fatty acids as well as the

lack of appropriate toxicity studies at these low levels. By continuing to monitor Hg levels in different regions of Alaska, we hope to have solid data for risk assessment when the results of toxicity studies become more definitive.

ACKNOWLEDGMENTS

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Antithrombotic Therapy for Stroke Prevention among Medicare Beneficiaries Hospitalized in Alaska with Atrial Fibrillation

Mary Ellen Gordian, MD, MPH⁽¹⁾

Henry D. Mustin, MD, MPH^{*(1)}

ABSTRACT

Although warfarin therapy reduces the risk of stroke among patients with atrial fibrillation (AF), the risk of hemorrhagic complications and other concerns may make clinicians reluctant to prescribe this treatment for elderly patients. Aspirin is a lower-risk alternative to warfarin but is also less effective. This study examines the use of antithrombotic therapy with warfarin or aspirin at hospital discharge among 182 Medicare beneficiaries 65 or older with chronic AF who were admitted to nine Alaska hospitals during 1996. Sixty-five percent of patients without contraindications were discharged on warfarin, and an additional 16% received aspirin. The rate of anticoagulation with warfarin was much higher among patients aged 65-74 (95%) than among those 75 or older (45%). The relatively low rate of warfarin use for very elderly patients may represent an opportunity to improve care. Although these patients have the highest risk of hemorrhagic complications, they also have the greatest potential to benefit from anticoagulation.

INTRODUCTION

Atrial fibrillation (AF) is a major risk factor for stroke. The stroke rate among patients with nonrheumatic AF is about five times higher than the rate among comparable patients in normal sinus rhythm (1). AF can lead to stroke through the formation of left atrial thrombi, which can become emboli (2).

The prevalence of AF increases with age, with a rate of about 6% among people 65 or older (3) and

9% among those in their 80s (1). AF accounts for about 10% of strokes among people in their 70s and about 24% of strokes among people in their 80s (1)

A number of clinical trials have shown that warfarin therapy can reduce the risk of stroke by about two-thirds and the risk of death by about one-third among AF patients (4-11). Aspirin therapy also reduces stroke risk among AF patients, but to a lesser degree than warfarin (5, 8, 11-13).

Despite evidence about warfarin's effectiveness for preventing stroke, several investigators have recently concluded that anticoagulation therapy is underused for AF patients, especially for the very elderly (14-17). Physicians may be reluctant to prescribe warfarin because of the potential for bleeding complications and the need for careful surveillance of anticoagulation intensity (18).

Recommendations concerning the use of warfarin for AF patients have been issued by the Agency for Health Care Policy and Research (AHCPR) (19). These suggest warfarin therapy for all AF patients who are at increased risk for stroke because of age 60 or older, prior stroke, diabetes, hypertension, or heart disease. If warfarin is contraindicated, aspirin is recommended. The AHCPR's treatment algorithm is shown in Figure 1. The American College of Chest Physicians published similar guidelines in 1995 (20).

Our study reports on the use of both warfarin and aspirin as antithrombotic therapy for Medicare patients 65 or older who were discharged from Alaska hospitals in 1996 with AF. In addition, we collected demographic information and reviewed discharge planning practices for these patients.

METHODS

PRO-West requested medical charts for Medicare patients 65 or older admitted to nine Alaska

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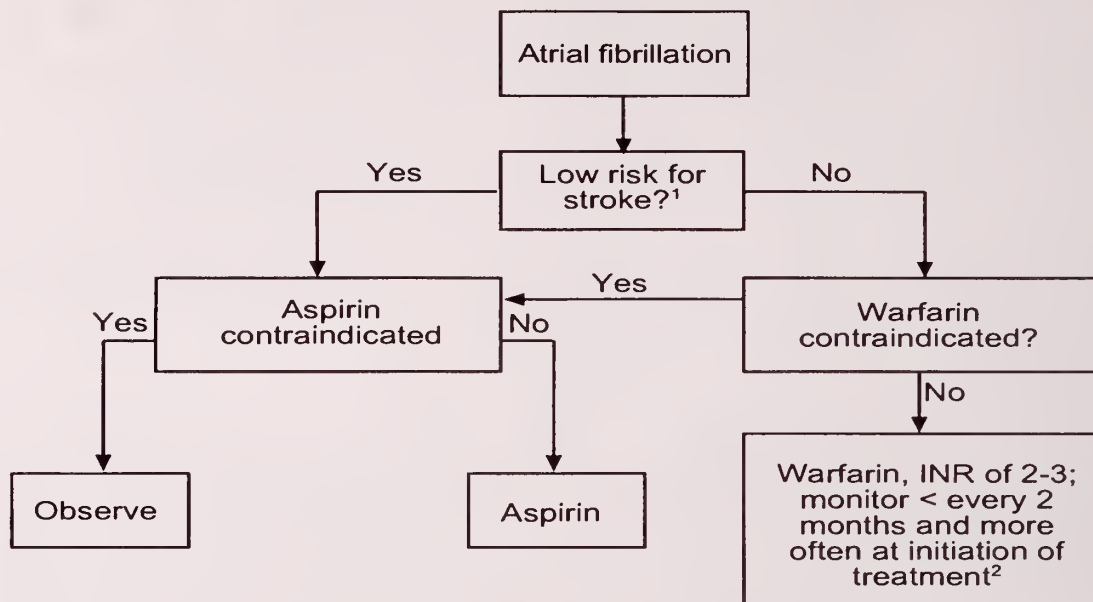


Figure 1. Algorithm for anticoagulation therapy in patients with atrial fibrillation.

¹Low stroke risk: age <60 years with none of the following: previous transient ischemic attack, stroke, hypertension, diabetes mellitus, congestive heart failure, echocardiogram with left atrial enlargement, or global left ventricular dysfunction.

²INR: international normalized ratio is a measure of prothrombin time that adjusts for differences in thromboplastin reagents used by different laboratories. INRs between 2 and 3 are currently considered optimal for atrial fibrillation patients.

Source: Agency for Health Care Policy and Research (19).

hospitals during 1996 with a principal or secondary diagnosis of AF and a nonsurgical diagnosis-related group (DRG). PRO-West staff abstracted the charts using a tool tested for 95% interrater reliability. Patients were excluded if the chart lacked documentation of AF or indicated a surgical DRG. Patients were also removed from the analysis if they died in the hospital, were transferred to another acute care hospital, or failed to show AF on the last ECG or rhythm strip before hospital discharge.

Charts were reviewed for the following contraindications to warfarin anticoagulation: recent major trauma or surgery, recent bleeding episodes, history of stroke or cerebral aneurysm, terminal illness, severe renal or hepatic disorders, dementia or Alzheimer's disease, ulcers, sepsis, and concurrent use of nonsteroidal anti-inflammatory drugs. Any other condition specifically designated as a contraindication to warfarin in a physician chart note was also regarded as such.

Discharge planning for patients discharged on

warfarin was also assessed. Charts were reviewed for documentation of patient education about the use of warfarin and the signs and symptoms of possible complications. We also looked for an indication in the discharge plans that laboratory tests to determine the level of anticoagulation had been scheduled or that follow-up visits with a physician had been arranged.

RESULTS

We initially identified 412 Medicare beneficiaries 65 or older who were hospitalized in 1996 in Alaska with a purported principal or secondary diagnosis of AF and nonsurgical DRG. We excluded eight patients either because there was no documentation of AF in the chart (six patients) or because surgical DRGs were noted (two patients). Thirteen patients died in the hospital, 16 were transferred to other acute care facilities, and one had an incomplete chart. The largest group excluded consisted of 192 patients who had a diagnosis of AF but who did

Table 1. Age and gender distribution of Alaska Medicare beneficiaries hospitalized with atrial fibrillation who were included in the analysis.

	Age 65-74	Age ≥ 75	Age 65+
Male	29 (48%)	54 (45%)	83 (46%)
Female	32 (52%)	67 (55%)	99 (54%)
Total	61 (100%)	121 (100%)	182 (100%)

not show AF on the last ECG or rhythm strip prior to discharge.

Among 182 patients included in the analysis, 54% were women and 46% were men. The mean age was 78.4 years, and 66% were 75 or older. The age and gender distribution of patients included in the analysis (Table 1) was similar to that of the larger group from which they were drawn.

Fifty-three percent of patients included in the analysis had no documented contraindications to warfarin. Among these patients, 65% were discharged on warfarin, and an additional 16% received aspirin. Thus, 81% of patients without warfarin contraindications received antithrombotic therapy (Figure 2). Analysis by age showed that the rate of warfarin use was much higher among patients aged 65-74 (95%) than among those 75 or older (45%) (Figure 3).

Among patients with at least one contraindication to warfarin, 35% received warfarin therapy, and 30% received aspirin. Thus, 65% of patients with warfarin contraindications received antithrombotic therapy.

Overall, 74% of patients in the analysis

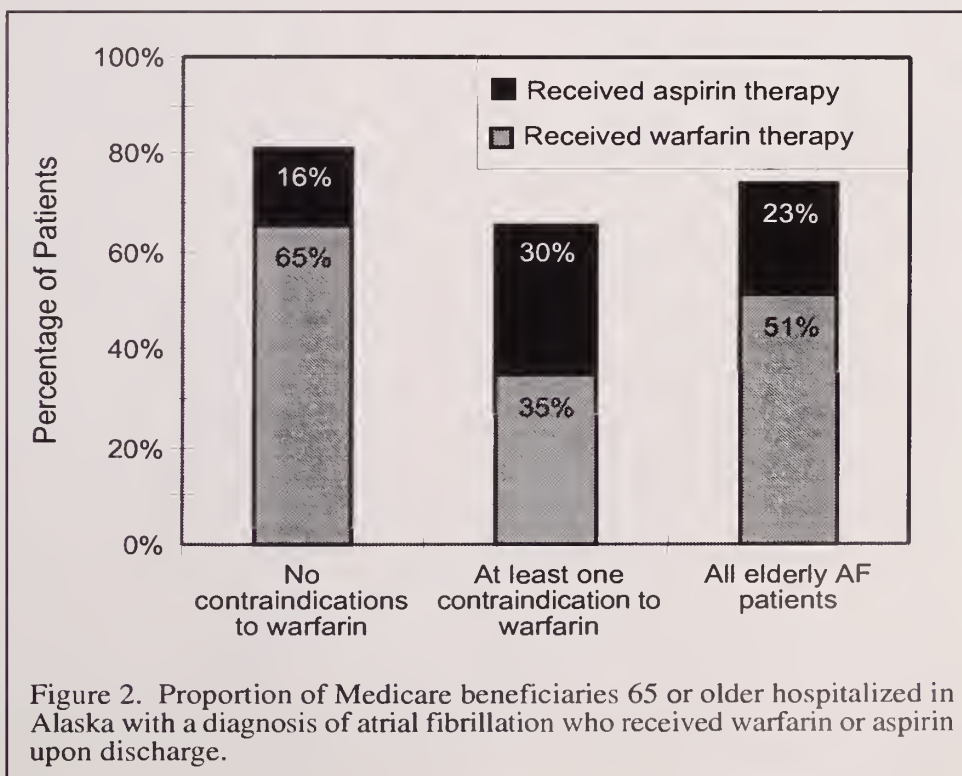
were discharged on antithrombotic therapy with either warfarin (51%) or aspirin without warfarin (23%). The few patients discharged on both warfarin and aspirin were counted in the warfarin group.

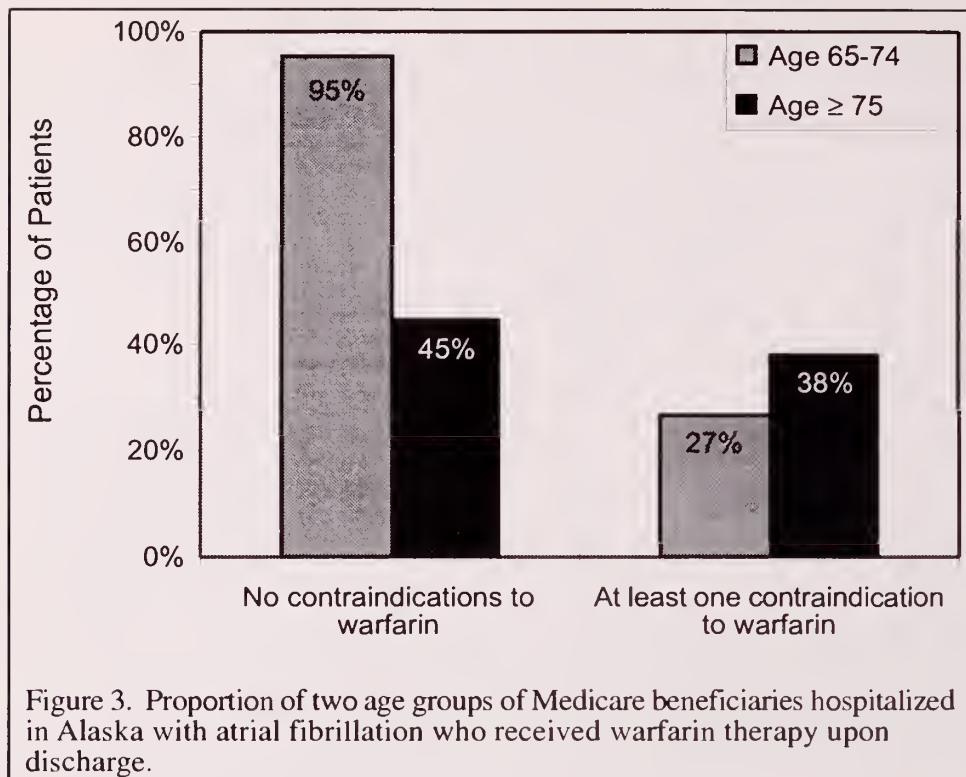
Discharge planning was assessed only for patients discharged on warfarin. Of these, 34% received education about anticoagulation therapy, plus a scheduled follow-up laboratory appointment, a follow-up doctor's office visit, or both.

DISCUSSION

Rates of warfarin therapy at hospital discharge for AF patients 65 or older in Alaska appear to compare favorably with those reported in other studies. Whereas 65% of patients without contraindications received warfarin at discharge in our study, 38 to 44% of hospitalized AF patients without contraindications received warfarin at discharge in other published studies (14, 21, 22). Patients in these other studies, however, were somewhat different from those in our own. For example, a study by Albers et al. (22) of care at university hospitals included patients younger than 65 and those with paroxysmal or new-onset AF as well as chronic AF.

Our finding that 81% of Alaska patients 65 or older without contraindications to warfarin were discharged on antithrombotic therapy with warfarin





Anticoagulation therapy may be underused among very elderly patients for a number of reasons. Some clinicians may be unaware of the results of recent randomized, controlled trials of warfarin use, or they may be skeptical about the applicability of the results to clinical practice (18, 24). At least one author has noted, for example, that 90% of AF patients have been excluded from clinical trials of warfarin (24). Also, patients in clinical trials have high compliance rates and excellent monitoring, which is

or aspirin is similar to the results from the study by Albers et al. The university-based investigators found that 78% of AF patients without contraindications were discharged on antithrombotic therapy, with 44% receiving warfarin (or warfarin plus aspirin) and 34% receiving aspirin (22). In other studies, 60 percent or less of AF patients included in analyses were discharged on antithrombotic therapy (14, 16).

We found that patients 75 or older in Alaska were much less likely than those aged 65-74 to receive warfarin. Although it is possible that some of these individuals may not have been appropriate candidates for warfarin treatment, this finding likely represents an opportunity to improve care. Lower than recommended utilization of warfarin among those 75 or older is consistent with earlier results of physician surveys (23) and analyses of clinical practice patterns (16, 17). Another potential opportunity to improve care lies in our finding that only about a third of the patients discharged on warfarin therapy had documentation of patient education concerning anticoagulation therapy. Although warfarin was prescribed for about one-third of patients with contraindications to warfarin according to our definition, we did not attempt to ascertain whether these relative contraindications were outweighed by other important clinical considerations. Further study would be required in order to assess the extent of inappropriate warfarin use.

not always true in clinical practice (18).

Because patients in clinical trials have been much younger on average than those typically seen in clinical practice, some have questioned whether warfarin therapy has been demonstrated to be clearly efficacious for very elderly patients (24). Most trials of warfarin therapy have not included large numbers of patients over age 75, and one trial that did (the second Stroke Prevention in Atrial Fibrillation study [SPAF II]) showed no advantage of warfarin over aspirin (10). Critics of this trial, however, contend that the “therapeutic range” defined for anticoagulation was too wide and led to an unnecessarily high rate of intracranial hemorrhage, which offset warfarin-related reductions in the rate of ischemic stroke (18, 25).

Risk of major hemorrhage associated with warfarin therapy in very elderly patients appears to be a substantial concern for many physicians. Some clinicians may have been alarmed by the results of the SPAF II study, which found an intracranial hemorrhage rate of 1.8% per year with warfarin therapy in elderly patients. Most trials, however, have found an intracranial bleeding rate of about 0.3% per year (26).

Marine and Goldhaber (18) have recently reviewed factors other than clinical trial results that may bear on clinicians’ thinking about warfarin therapy for very elderly patients. One is that very old

patients are often at risk for falls. Also, dietary intake among many seniors is deficient in vitamin K, and decreased levels of vitamin K can potentiate the anticoagulant effect of warfarin. Another consideration is that elderly patients are often taking other medications, many of which can interact with warfarin. Addressing these concerns is important for reducing the risk of bleeding complications among the very elderly.

Another potential difficulty with warfarin therapy is the need for high-quality monitoring of the international normalized ratio (INR) to maintain treatment within the therapeutic range (usually defined as an INR between 2.0 and 3.0). Such monitoring can be time-consuming, tedious, and uncompensated (18). It is critical, however, because anticoagulation is ineffective if the INR is less than 2.0 and can lead to high rates of bleeding complications if the INR is greater than approximately 4.0 (27). The difficulty of maintaining an appropriate INR is highlighted by studies of clinical practice showing that warfarin therapy for AF patients is typically above or below the therapeutic range a substantial portion of the time (15, 28, 29). The burden of INR monitoring from the patient's perspective, as well as fear of bleeding complications, may help to explain anecdotal evidence that many patients refuse warfarin therapy (14, 15).

The current study has several noteworthy limitations. First, our analysis excluded patients with paroxysmal AF, even though they have the same risk of thromboembolism as patients with chronic AF (4). Second, because our analysis is based on hospital records, it does not document anticoagulation therapy initiated after hospital discharge. Third, it did not differentiate between aspirin given as an antithrombotic agent and aspirin taken for other reasons, such as anti-inflammatory effects. Fourth, although we found a lack of documented patient education concerning warfarin therapy, it is possible that hospital records may have underestimated this aspect of care. Fifth, some potential contraindications to warfarin may not have been identified through retrospective medical record abstraction, so this study may underestimate the proportion of patients with warfarin contraindications.

Despite its limitations, this study has shown that antithrombotic therapy with warfarin or aspirin is commonly prescribed at discharge for hospitalized AF patients 65 or older in Alaska. A relatively low rate of warfarin use among very elderly patients may represent a substantial opportunity to improve care. Although these patients have the highest risk of

hemorrhagic complications, they also have the greatest potential to benefit from anticoagulation.

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Dr. Sam W. Gibson has opened a private office for the practice of obstetrics and gynecology. Dr. Gibson is board certified in Ob-Gyn and was formerly in practice in Eugene, Oregon.

Dr. Eldon Maxwell has become associated in a general practice office with *Dr. C. F. Nicholas*.

Dr. Marcell Jackson has joined *Dr. Charles F. St. John* in his general practice office.

Dr. Nancy Sydnham closed her general practice office and moved to Juneau when her husband was transferred from Anchorage.

Dr. Richard Curtis left Seward and joined the Doctors Clinic for six months pending the start of his Ob-Gyn residency at the University of Colorado.

Dr. John F. Lee of Aberdeen, South Dakota, a board certified general surgeon, has been appointed Director of the Alaska Native Health Area Office. He replaces *Dr. Holman Wherritt* who has been appointed Assistant Director for the Division of Indian Health. Dr. Wherritt, who has been assigned to Anchorage since 1961, will now be stationed in Washington, D.C.

Drs. Jean and John Chapman plan to open an office in general practice here in June.

Dr. John Chapman (Rep.) will run for the State House of Representatives this year.

Dr. Edwin C. Kraft is leaving the Anchorage Clinic in July to take over a mission hospital in Southwest Uganda (Ishaka Hospital, 75 beds, 40 miles from Mbarara) where he will be the Director and only surgeon.

Drs. Helen and Robert Whaley have returned to medical practice here after a two year absence. Dr. Robert Whaley, a board certified Internist, is opening a private office in internal medicine. Dr. Helen Whaley, who is board qualified now in neurology after two years at Stanford, plans to restrict her practice to neurology. Dr. Helen Whaley is also a board certified pediatrician. I hope that she will now resume her previous role as originator of this Muktuk

column.

Back after one year in Da Nang with the Marines, and one year as Visiting Professor of Orthopedics at Vanderbilt, is *Dr. William Mills*, a board certified orthopedic surgeon. He looks just the same; I wonder how Vanderbilt looks.

Also back to his general practice after several months absence is *Dr. Glen Crawford*.

On the debit column of old friends is *Dr. Peter J. Koeniger*, who has closed his ob-gyn office here after 18 years to enter practice in Aberdeen, Washington, where he also plans to play a little golf in the rain.

Now in private practice here are *Drs. Jean and John Chapman* who recently opened offices in family practice. Before Dr. John Chapman's recent one year service as Alaska Commissioner of Health and Welfare they practiced in Cordova for five years. Dr. Jean Chapman has also had a practice in Juneau for the past year.

Dr. Donald B. Addington of Phoenix has opened Alaska's first office for the practice of plastic and reconstructive surgery. Dr. Addington is board qualified in plastic surgery.

Dr. Clyde F. Deal of Mobile has joined the Anchorage Clinic in general surgery. Dr. Deal, who left Anchorage four years ago to enter his residency, previously spent a year here in practice with *Dr. Charles F. St. John*. He is board qualified in general surgery and replaces *Dr. Edwin Kraft*, who took off for his Uganda mission hospital post across the Greenland ice cap in his old Beechcraft Bonanza.

Dr. George Senffert of New York has entered the private practice of Anesthesia in Anchorage. Dr. Seuffert was recently with the USPHS in Anchorage and is board qualified in anesthesia. With his entrance into private practice the anesthesia manpower situation is finally almost adequate, and we hope to see expansion of ancillary services such as inhalation therapy.

Dr. Carl Beck had a baby girl, *Dr. Chalmers* a boy, *Drs. Louise and Fred Hillman* adopted a baby boy, their second, *Drs. Wallace and Y. O. Dunn* had

a girl, their fourth, and *Dr. Marcell Jackson* had a boy, her second. *Dr. Michael Hein* had a second son on February 29. *Dr. Paul Dittrich* has a second son. *Dr. Kenny Ashby* had his first daughter, fourth child.

The Tri-borough Air Resources Management District in Anchorage has been awarded \$50,716.00 by the USPHS for continuation of its efforts to develop an air pollution control program in the Greater Anchorage Area, Kenai Peninsula, and Matanuska Susitna Boroughs.

Dr. Martin Palmer, a board certified internist from New Orleans has joined the Anchorage Clinic.

Dr. Alex B. Russell of Georgia has opened a general practice office at The College Medical Center. Dr. Russell completed one year of a pediatric residency.

The 10th Annual Heart Association Clinic in September was again a great success. From September 9 through 13 four Mayo Clinic cardiologists sourced the state consulting on patients and lecturing on topics preselected by Alaskan physicians.

With two pediatric and two adult cardiologists it was possible this year to split the team to Fairbanks and Sitka simultaneously. The clinic tour was then completed by all four men at Anchorage, providing all areas more consultation and lecture time than in past years, and hopefully not exhausting our guests as much.

FAIRBANKS

Dr. Robert Hanek of Wisconsin, recently with the USPHS in Tanana and Sitka, has joined the Fairbanks Clinic in general practice.

The Greater Fairbanks Hospital Association has now raised an astounding \$1,750,000.00 in local donations and pledges, with the able fund raising assistance of the Lutheran Society of Homes and Hospitals of Fargo, North Dakota. The actual hospital planning starts shortly, and it is hoped that construction can begin next year. The proposed site is near Lathrop High School and is on the Hospital Reserve Land of the city and the borough. As it is above the recent high water mark, it will be built by carpenters rather than shipwrights.

Dr. John Fenner, formerly in practice in Fairbanks was allegedly shot and critically wounded recently in California.

GLENNALLEN

Dr. James S. Pinneo returned to his general surgery practice here in September after a one year absence.

HOMER

Dr. Paul Eneboe has opened his general practice office here. Dr. Eneboe was until recently with the USPHS in Bethel. He takes the place of Dr. George Leih, who has entered a psychiatric residency.

JUNEAU

The regional medical program communication and medical education grant for Southeastern Alaska has been approved and funded and should be of significance as a pilot project. Under the leadership of *Dr. Henry Akiyama* a greatly accelerated and regularly scheduled course of clinics and seminars is planned, as well as an EKG hot line program. In addition, locum tenens assistance will be provided while isolated physicians go out for postgraduate training. Under this program *Dr. David Dale* of Wrangell is presently taking a three weeks postgraduate course in Seattle, while *Dr. Miles Jones* of Seattle's Public Health Hospital provides medical coverage in Wrangell. This entire program seems to be a well thought out pioneering effort and will be watched with great interest.

Dr. R. Harrison Leer, 48, passed away recently in Seattle shortly after falling ill while on a clinic in Haines. He had just reopened his offices in ophthalmology in Juneau after some years absence.

Dr. Kenneth Moss of Kentucky, a board certified pediatrician, recently with the USPHS in Anchorage, has opened a private pediatric office here.

Dr. Gary Hedges of Juneau has completed his surgical training in Ohio and plans to open his practice in general, vascular and thoracic surgery late in September. Dr. Hedges is board qualified in general and thoracic surgery.

Dr. Joseph O. Rude is making weekly visits to Skagway where at present there is no physician.

KENAI

Dr. Robert Stelle of Juneau has joined the Peninsula Medical Center and opened a full time office in general practice in Kenai.

Dr. Peter Hansen has opened a solo office in general practice here.

The Peninsula General Hospital Board is actively continuing the search for money to complete construction of this much needed facility on the booming Kenai Peninsula. Apparently they are about the price of one large helicopter away from being

Muktuk Morsels of 1968 - continued

ready to open.

Dr. Calvin Johnson has moved his home to Kenai. He now commutes daily to his part-time Anchorage office.

KETCHIKAN

The Regional Medical Program plans to provide various lecturers from Washington State to make the Ketchikan, Juneau and Sitka tour every two months. A series of telephone lectures from the University of Washington is also planned, starting in June, and educational TV tapes have been made available if facilities for viewing can be arranged.

The new wing of the Ketchikan General Hospital should be completed in July. This will eventually result in an additional 40 long term nursing beds becoming available, although only 20 beds will be installed initially.

A recent cannery fire at Waterfall, Alaska near Ketchikan brought 33 patients in for emergency treatment. *Dr. James Wilson* gave us the following report:

"On the early morning hours of 7-13-68, the Filipino bunkhouse at the Waterfall cannery caught fire and burned to the ground. Five of the workmen died in the fire. Because the fire apparently originated in the kitchen facilities on the first floor, and the sleeping facilities were upstairs, the workmen had to escape through the upper windows, most of them jumping onto the rocky beach below.

Because of this, a considerable number had fractures of the back and of the lower extremities, more precisely, eight of the patients had compression fractures of the lumbar spine, some of them with multiple lumbar vertebra involved, and seven patients had comminuted fractures of the lower extremities. In addition to these serious injuries, several puncture wounds of the bottom of the foot, several patients with a concussion injury and interestingly enough, only three or four patients with first and second degree burns and one patient with fairly minimal third degree burns of the arms were seen.

KODIAK

Dr. Mildred McMurty married Mr. A. Copeland of Kodiak last winter. She is keeping her former name in her practice.

Dr. R. Holmes Johnson was right and also an excellent actor! The "Cry of the Wild Ram" presented in the Kodiak open air theatre was excellent and worth the time and travel to attend. A number of Anchorage physicians and their wives made this year's performance and all were highly pleased.

SITKA

Dr. William C. Charteris, 64, died in Sitka on April 30. Dr. Charteris, who for many years was the only physician and surgeon in the area, practiced in Sitka from 1936 to his retirement in 1961. He was formerly Sitka mayor and city councilman.

Dr. Ted Philips has a general practice preceptorship program now under way in Sitka, in affiliation with the University of Colorado Medical School. Under this "Rural Preceptorship Program for Medical Students", an elective rotation of one or more months is made available to 4th year medical students. He shares responsibility for the functioning of the preceptorship with *Dr. George Longenbaugh*.

SEWARD

Dr. Ernest Gentles has returned to general practice here.

SOLDOTNA

Dr. Paul Isaak reports an active general practice preceptorship program again in store for the peninsula this year. He has several physicians planning time off from their residencies in Iowa, including *Dr. Elaine Reigel* in pediatrics who is coming up for her second tour.

TOK

Dr. George Cummings Miller of Glasgow, Scotland, who first entered practice in Alaska in 1963 as a member of the Juneau Clinic, and has since practiced in Skagway, Fairbanks, Whitehorse, and Elsa, Y.T., has opened a private office in general practice in Tok.

WRANGELL

Dr. David Dale now has his first University of Colorado student in training. These men certainly deserve congratulations in making this learning ex-

perience available. It is not unreasonable to expect that their efforts, as well as those of *Dr. Paul Isaak* in Soldotna, will help provide a continuing supply of qualified physicians for Alaska, in addition to enriching the curriculum and medical understanding of the students involved.

We hear that federal funds have been granted to assist in the completion of a new 12 bed hospital here.

PORTLAND, OREGON

Morningside Hospital has apparently closed recently. It will be recalled that Alaskan patients were withdrawn last year to Alaskan facilities after many years of using Morningside for chronic in-patient hospital care.



(continued from pg 77 - Mercury content of fish)

7. Bloom NS. On the chemical form of mercury in edible fish and marine invertebrate tissue. *Can. J. Fish. Aquat. Sci.* 1992;49:1010-1017.
8. Cunningham PA, Smith SL, Tippet JP, et al. A national fish consumption advisory data base: a step toward consistency. *Fisheries* 1994;19:14-23.
9. Laskowski R. Are the top carnivores endangered by heavy metal biomagnification? *Oikos* 1991;60:387-390.

MIEC Reduces Rates 10%; Returns \$14 Million Dividend

Medical Insurance Exchange of California, the ASMA-sponsored professional liability insurance carrier since 1977, announced a 10 percent rate reduction, and a \$14 million policyholder dividend that will be credited against 1999 premiums of renewing policyholders. For Alaska policyholders, the credit will average \$7,368. This is MIEC's 10th consecutive year of dividends for Alaska policyholders.

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Letter to the Editor. . .

Dear Editor:

In connection with the efforts of the State Department of Public Health to complete MMR immunizations in school children, our community sponsored special “MMR Shot Clinics.” I submitted an article to our local newspaper, the Juneau Empire about measles memories. I’d like to share with my colleagues; the text of the article follows:

Kenneth Moss, MD
Juneau, Alaska

Some Personal Reminiscences About Measles

Measles Shots are Not a Volatile Issue — It’s Common Sense

After I returned from my trip back east on October 18, I was interested to see an article in the Juneau Empire entitled, “Measles Shots Still a Volatile Issue.” There was a quote from Dr. Emily Kane, a naturopathic doctor saying that it was “a volatile issue,” and that she “considers measles to be a fairly mild disease in healthy children.” With all due respect to Dr. Kane’s opinion, I would strongly disagree with this. Measles is NOT a mild disease, it is a pretty serious illness. I would like to share some of my own memories and experiences about measles.

When my family developed measles in December 1943, we were living on a farm in Illinois and World War II was going on. There were five children in the family, and I was the eldest. I know that we were very, very sick. Dr. H. P. Moulton, the family doctor who was then about my current age and exempted from military service, made several house calls to our home. He told my mom, “Elizabeth, I think your children have had the whooping cough and measles at the same time.” I have had my doubts about his diagnosis in retrospect, thinking that perhaps he had just confused the terrible wracking cough and high fever that accompany measles with the symptoms of whooping cough. However, when I checked with my Mom this month, she said that young Bernie, who was age two, had been exposed to cousin Donny, who definitely had the whooping cough, and then had developed symptoms. Maybe

we did have whooping cough followed by measles. The whooping cough, or pertussis, is a bacterial illness, and measles is a viral illness, but the vaccine wasn’t available for either one during those years.

The symptoms and signs of measles are a very high fever, coughing in severe episodes, conjunctivitis with red eyes and the eyes being sensitive to light, “Koplik’s spots,” (little blue spots within the mouth), and coryza, severe runny nose. Our farm house had no central heat, and it was such a cold winter that the water froze in the sink in the kitchen while our parents tried to keep us warm by the stove in the living room. We were feverish, coughing, and thoroughly miserable.

Current articles will emphasize that a complication such as encephalitis, pneumonia, etc., may accompany the measles. I don’t think they *emphasize enough* the fact that secondary infections are very common. When Dr. Moulton came out again, he said that baby Ronnie, age six months, had pneumonia. “Folks, it’s all over his left lung, and it’s pretty bad. I’m not sure that he’s going to get over this.”

The nearest hospital was in Springfield, Illinois, 30 miles away. Our parents couldn’t leave the rest of us and take the baby there, so he was treated at home. “If we had some of this new penicillin that the army doctors have I would give it to him, but it is all being used up in the war. But, we do have the sulfa drugs and they usually help. I’ll try him on the sulfa drugs and we’ll see.” I am happy to say that baby Ronnie did indeed recover after a very miserable illness and now is middle-aged Ron, an architect (and co-designer of the Empire building).

Fast forward several years to 1954. About that time, a lot of work was going on with the polio virus and other viruses, and Dr. John Enders in Boston isolated the measles virus. A couple of years later it was successfully attenuated and modified, and field trials began with a measles vaccine.

During the fifties I was in medical school in Louisville, Kentucky. We students had plenty of opportunity to see children with measles in the emergency departments, clinics, and hospital wards.

For some reason I missed the lecture on measles in my pediatric rotation, and sure enough, when I came up to have my oral examination during my senior year of medical school, of course one of the questions dealt with measles. Dr. Frank Faulkner, a courtly Englishman then at Louisville, and later in research at Berkeley, was my examiner. He asked me one simple question: “Mr. Moss, if you have a case of the measles, is the fever a high-grade or low-

grade fever?" I didn't know the answer at the time, and decided I had a 50-50 chance to punt. I answered very hesitantly, "Er — I think a low-grade fever." Dr. Faulkner did not shout at me or put me down at all, but simply replied, "Oh, no Mr. Moss, I think that you will find that it is a very high fever. The rash of measles erupts during the height of the fever, and it may be quite high, 103 degrees or 104 or more. You must be thinking about German measles, or rubella, which often has a lower-grade fever." Well, Dr. Faulkner could have, or should have, flunked me, but I am glad that he did not, and I have always remembered, and saw for myself, that measles is indeed an illness with a *high* fever.

In the research labs, various strains of the measles virus were modified and tried as a vaccine. There was an Edmonson B strain, used as a killed measles vaccine, tried in 1963, but it did not result in a very good immunity, that is, it was one which did not provide complete or lasting protection. In 1965, the Schwarz strain was further attenuated as a live virus vaccine, and in 1967 the killed measles vaccine was withdrawn.

I returned to the Cincinnati Children's and General Hospital in 1963 for residency and spent a lot of time in the emergency wards and the receiving wards at those hospitals. There was a large indigent population there, and as house staff physicians we saw hundreds of cases of the last big measles epidemic that was sweeping around the country at that time. Again, it was not a mild illness at all. A large proportion of the children had pneumococcal pneumonia. Many had lymphadenitis and ear infections, some with mastoiditis. All of them had raging headaches, photophobia (light sensitivity), listlessness, dehydration, and lethargy. Lots of penicillin shots were given to try to keep kids out of the hospital beds but sometimes they wound up there simply because they were so sick they could not be cared for at home.

One winter day I was on the Neurological Ward at the Children's Hospital and saw a very handsome lad of about ten years old. He was sitting in a large crib and rocking back and forth, staring vacantly, with a repeated moaning sound. When I reviewed the chart, it revealed he'd had the complication of measles encephalitis. This is unusual - one in 1,000 incidence - but this boy had indeed suffered measles encephalitis a few years before and was left in this condition. Sandy red hair, hazel eyes, freckles - a

picture of an attractive youngster, but left in a nonverbal, vegetative, blind state from damage to his nervous system by the rubeola virus.

Fast forward again to 1966. At that time I was working in pediatrics at the Alaska Native Medical Center in Anchorage. We were providing immunizations for many of the interior villages, going out for field clinics, etc. I don't remember exactly which combined vaccine we used - (the full MMR [measles, mumps, rubella] vaccine wasn't developed until 1971), but it was one of the earlier, less attenuated ones at that stage of development. Out at the village of Chevak, north of Bethel, I had pediatric clinic at the school house and saw about 200 children. We gave them all the relatively new measles vaccine.

The villagers and the health aide and teachers were quite willing for us to immunize against a disease they knew all too well, and I felt very proud of my work. I felt I'd prevented lots of disease, and went on back home to Anchorage.

About ten days later we received from the health aide that 200 children in the village had had high fevers and some a rash.

The vaccine had not yet been attenuated as much as it is now, and though none of the children became terribly ill, they did have the fever and a mild rash. The only comfort that I had was to think that I had prevented some real measles, and that if they had reacted this much to a weakened strain of vaccine, they probably would have been a lot sicker if they had contacted the wild strain.

Going forward again to 1977. I was in practice here in Juneau and I received a call from Frank Kearns, the manager of Glacier Bay Lodge in Gustavus. His daughter and son-in-law from Utah were coming up, but their daughter Rachel, age 16 months, was very ill. I managed to see little Rachel in my office. She had the signs of rubeola, with a temperature of 104 degrees, and a generalized rash. We did serological tests to confirm the diagnosis, and then instructed in care.

About nine days later I received a call from the Kearns family that their teenagers, aged 13 and 15 had developed cold and flu symptoms, then high fever and generalized rash. For some reason, they had received some type of an ineffective measles vaccine earlier in life, and had acquired the illness from their little niece. Frank Kearns made a very appealing offer to me — "Instead of my bringing the

Measles is *not* a mild illness. . . Don't hesitate to protect your children.

girls over there, why don't I fly you over here and put you up in the lodge, and you can look at the kids?" I said it was a deal if I could bring my teenage son along. David and I flew over, and I had a chance to see these youngsters. It was a large Mormon family and they were very cordial to us. We had a very nice dinner with them that evening. I kept looking at the 13-year old and the 15-year old — one of them had clinical pneumonia and needed antibiotics, and I remember thinking, "Boy, I sure wouldn't want my kids to be this sick if I could do anything to prevent it." (Actually, my son and I had a great time - in addition to putting us up at the lodge, after we had our work done Frank took us out halibut fishing the next day).

The State Epidemiology Department came on in, did an excellent survey of susceptibility, and gave gamma globulin and immunizations to the children who needed it.

Flash forward again to 1990. The question of whether one needs one dose or two of MMR vaccine was being debated nationwide. Most, advised by the Advisory Committee on Immunization Practices of the CDC, as well as the American Academy of Pediatrics and the American Academy of Family Practice, had been recommending a change in national vaccination policy to add a second dose. However, there was a limitation of funding at the state level at that particular time, and the decision was made for the Department of Public Health *not* to implement a two-dose MMR vaccine, as a state policy — that is, not to purchase the second dose for children. At that time, many of us in private practice felt that it was a good idea and we purchased the vaccine privately and urged our patients to have a second dose.

Then we come to 1996. As many will remember, the Auke Bay School had the star role for the nation that year, as having more cases of measles in the area than any other part of the country. The Department of Epidemiology and Public Health did some efficient case finding and epidemiology research, then catch-up work on isolation, quarantine, and immunization, and confirmed the epidemic. Excellent efforts were made by Mary O'Bryan, the nurse manager at the Juneau Health Center and her co-workers; Dr. Peter Nakamura, Director of Public Health; and Don Novantney, Infection Control Coordinator at Bartlett Regional Hospital in the case finding, prevention, and treatment.

Because of Juneau's 1996 experience, the policy of the state was changed toward provision of a second MMR dose for its citizens. It was decided

that indeed a second dose of MMR was advisable, so therefore it was required that a second dose was necessary to enter kindergarten or first grade. There were, of course, lots of kids who had had only one MMR vaccine who were already enrolled in school, who had not been provided the second dose.

Now we come to 1998, and an epidemic again in Anchorage. Because there may be a 5% primary failure of immunity, or that there may be a waning secondary immunity that dwindles over time that needs to be boosted, it has become evident that a second MMR vaccine is necessary to prevent measles, and it's being provided by the State Department of Public Health.

Measles is *not* a mild illness, it is a serious one. It is preventable, and the prevention is safe. Prevention can save much misery, and sometimes, life.

Check your child's immunization record. If there is no record of a second MMR vaccine, go to your clinic, or to your doctor and get him or her caught up. Take advantage of free MMR immunization clinics being provided. Don't hesitate to protect your children; believe me it is worth it.

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Editorial...

Fiscal and Patient Care Concerns

The arrival of winter 1998-1999 has sent the tourists home and the legislators on their heels back to the capitol halls in Juneau. The prosperity of the Lower 48 and our reversal of fortunes with the oil slump brings a whole new cycle of fiscal and patient care concerns to the forefront. How can we contain costs, comply with federal mandates, contend with the Juneau bureaucratic control and provide adequate health care for all Alaskans? We need to address these issues thorough some forum to make an impact on our state officials or we will continue to be pawns and see our input in the health care arena erode. As economic pressures, as well as local and statewide/regional-wide competitive pressures mount, the demands on all of us grow. We need a constant reminder that our only unified voice at present is the ASMA and ALPAC forum. Individual pressure on our legislators and state administrators is critical to maintain some corroborative voice of reason as well.

The IPO avenue has been initiated in Anchorage, HMO and large insurance players, the federal triccare conglomerates, specialty group mergers and medicare/medicaid administrators are all looking for answers. Lower 48 medical markets seen to be rushing past the old concepts of managed care and gatekeeper theories and into a more "mature concept" with "disease management protocols." These require not only astute business acumen to maintain solvency, but also accurate data and creation of highly efficient but yet effective patient care guidelines by disease state. As these become reality, implementation of those clinical guidelines and new minimally invasive diagnosis and therapeutic approaches to disease are going to explode.

We are at the beginning of new opportunities in medicine. Our mind set is crucial to our survival. We must endeavor to change what is possible, but to rapidly adapt to that which we cannot and continue to press for constant improvement in patient care. Our survival as a profession and our patients demand it.

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